



**NATIONAL SCIENCE OLYMPIAD
ROUND-I PAST PAPER 2023
MATHEMATICS
(FOR ALL CLASSES)**

1. Introduction

This document would help users easily find the past papers and understand the different topics. There may be some errors in past papers in their answers or questions. Student should verify all answers through teachers, Google etc.

Moreover, to understand these papers & other scenarios of the Olympiads links YouTube tutorials are given below. Watch the videos and clear your understanding.

Click to Watch Video about Syllabus <https://youtu.be/ZH2Ad8tGAXo>

Click to Watch Video about Model Paper
<https://youtu.be/6yNQNLkC1RA>

Click to Watch Video about Past Papers <https://youtu.be/iG8htCRrW4I>

Class One Math Past Paper

1. How many fingers are on one hand?

- a) 4
- b) 5
- c) 6
- d) 10

Correct Answer: b) 5

Justification: One hand has 5 fingers.

2. Which number comes after 7?

- a) 6
- b) 8
- c) 9
- d) 10

Correct Answer: b) 8

Justification: 8 comes immediately after 7.

3. Which number comes before 5?

- a) 3
- b) 4
- c) 6
- d) 7

Correct Answer: b) 4

Justification: 4 comes immediately before 5.

4. Count the numbers: 1, 2, 3, 4, ____

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: a) 5

Justification: After 4 comes 5.

Class One Math Past Paper

5. What number is shown by three stars? ☆☆☆

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b) 3

Justification: There are 3 stars.

6. What number is shown by six circles? ●●●●●●

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: b) 6

Justification: There are 6 circles.

7. Which number is greater?

- a) 2
- b) 5
- c) 1
- d) 3

Correct Answer: b) 5

Justification: 5 is greater than 2, 1, and 3.

8. Which number is smaller?

- a) 8
- b) 6
- c) 3
- d) 9

Class One Math Past Paper

Correct Answer: c) 3

Justification: 3 is the smallest number.

9. Count by 2s: 2, 4, 6, ____

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: b) 8

Justification: We add 2 each time: 2, 4, 6, 8.

10. Count by 5s: 5, 10, ____

- a) 12
- b) 13
- c) 14
- d) 15

Correct Answer: d) 15

Justification: $5 + 5 = 10$ and $10 + 5 = 15$.

11. How many boxes are there? 

- a) 3
- b) 4
- c) 5
- d) 6

Correct Answer: b) 4

Justification: There are 4 boxes

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12. How many balls are there? 

- a) 4
- b) 5

Class One Math Past Paper

- c) 6
- d) 7

Correct Answer: b) 5

Justification: There are 5 balls.

13. Which number is between 8 and 10?

- a) 7
- b) 8
- c) 9
- d) 11

Correct Answer: c) 9

Justification: 9 comes between 8 and 10.

14. Count backward: 10, 9, 8, ____

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: b) 7

Justification: Counting backward from 8 gives 7.

15. How many toes are on one foot?

- a) 4
- b) 5
- c) 6
- d) 10

Correct Answer: b) 5

Justification: One foot has 5 toes.

16. What comes next? 11, 12, ____

Class One Math Past Paper

- a) 10
- b) 13
- c) 14
- d) 15

Correct Answer: b) 13

Justification: 13 comes after 12.

17. What comes before 15?

- a) 13
- b) 14
- c) 16
- d) 17

Correct Answer: b) 14

Justification: 14 comes immediately before 15.

18. What comes next? 20, 21, ____

- a) 19
- b) 20
- c) 22
- d) 23

Correct Answer: c) 22

Justification: 22 comes after 21.

19. What comes before 20?

- a) 18
- b) 19
- c) 21
- d) 22

Correct Answer: b) 19

Justification: 19 comes immediately before 20.

Class One Math Past Paper

20. What comes next? 25, 26, ____

- a) 24
- b) 27
- c) 28
- d) 29

Correct Answer: b) 27

Justification: 27 comes after 26.

21. What comes before 30?

- a) 28
- b) 29
- c) 31
- d) 32

Correct Answer: b) 29

Justification: 29 comes immediately before 30.

22. What comes next? 31, 32, ____

- a) 30
- b) 33
- c) 34
- d) 35

Correct Answer: b) 33

Justification: 33 comes after 32.

23. What comes before 40?

- a) 38
- b) 39
- c) 41
- d) 42

Correct Answer: b) 39

Justification: 39 is one less than 40.

Class One Math Past Paper

24. What comes next? 41, 42, ____

- a) 40
- b) 43
- c) 44
- d) 45

Correct Answer: b) 43

Justification: 43 comes immediately after 42.

25. What comes before 50?

- a) 47
- b) 48
- c) 49
- d) 51

Correct Answer: c) 49

Justification: 49 comes immediately before 50.

26. What comes next? 5, 6, 7, ____

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: a) 8

Justification: The numbers increase by 1.

27. What comes before 10?

- a) 8
- b) 9
- c) 11
- d) 12

Class One Math Past Paper

Correct Answer: b) 9

Justification: 9 comes immediately before 10.

28. What comes next? 14, 15, 16, ____

- a) 17
- b) 18
- c) 19
- d) 20

Correct Answer: a) 17

Justification: 17 comes after 16.

29. What comes before 25?

- a) 22
- b) 23
- c) 24
- d) 26

Correct Answer: c) 24

Justification: 24 comes immediately before 25.

30. What comes next? 18, 19, 20, ____

- a) 21
- b) 22
- c) 23
- d) 24

Correct Answer: a) 21

Justification: 21 comes immediately after 20.

31. What is $2 + 3$?

- a) 4
- b) 5

Class One Math Past Paper

- c) 6
- d) 7

Correct Answer: b) 5

Justification: $2 + 3 = 5$.

32. What is $5 + 4$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $5 + 4 = 9$.

33. What is $7 - 2$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $7 - 2 = 5$.

34. What is $9 - 4$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $9 - 4 = 5$.

35. What is $6 + 2$?

Class One Math Past Paper

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: b) 8

Justification: $6 + 2 = 8$.

36. What is $10 - 3$?

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: c) 7

Justification: $10 - 3 = 7$.

37. What is $4 + 5$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $4 + 5 = 9$.

38. What is $8 - 3$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $8 - 3 = 5$.

Class One Math Past Paper

39. Ali has 3 pencils. His friend gives him 2 more. How many pencils does Ali have?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $3 + 2 = 5$ pencils.

40. Sara has 8 candies. She eats 3. How many candies are left?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $8 - 3 = 5$ candies.

41. What is $1 + 7$?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: c) 8

Justification: $1 + 7 = 8$.

42. What is $10 - 6$?

- a) 3
- b) 4
- c) 5
- d) 6

Correct Answer: b) 4

Justification: $10 - 6 = 4$.

Class One Math Past Paper

43. There are 4 birds on a tree. 3 more birds come. How many birds are there now?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: b) 7

Justification: $4 + 3 = 7$ birds.

44. There are 9 balloons. 2 balloons fly away. How many are left?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: b) 7

Justification: $9 - 2 = 7$ balloons.

45. What is $3 + 6$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $3 + 6 = 9$.

46. What is $7 - 5$?

- a) 1
- b) 2
- c) 3
- d) 4

Class One Math Past Paper

Correct Answer: b) 2

Justification: $7 - 5 = 2$.

47. What is $5 + 5$?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: c) 10

Justification: $5 + 5 = 10$.

48. What is $12 - 2$?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: c) 10

Justification: $12 - 2 = 10$.

49. Hamza has 6 toy cars. He gets 3 more. How many toy cars does he have?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: b) 9

Justification: $6 + 3 = 9$ toy cars.

50. There are 11 flowers. 5 are picked. How many flowers remain?

- a) 5
- b) 6

Class One Math Past Paper

c) 7

d) 8

Correct Answer: b) 6

Justification: $11 - 5 = 6$ flowers.

Class Two Math Past Paper

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- b) 5
- c) 6
- d) 10

Correct Answer: b) 5

Justification: One hand has 5 fingers.

2. Which number comes after 7?

- a) 6
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Correct Answer: b) 8

Justification: 8 comes immediately after 7.

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- a) 3
- b) 4
- c) 6
- d) 7

Correct Answer: b) 4

Justification: 4 comes immediately before 5.

4. Count the numbers: 1, 2, 3, 4, ____

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: a) 5

Justification: After 4 comes 5.

Class Two Math Past Paper

5. What number is shown by three stars? ☆☆☆

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b) 3

Justification: There are 3 stars.

6. What number is shown by six circles? ●●●●●●

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: b) 6

Justification: There are 6 circles.

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- a) 2
- b) 5
- c) 1
- d) 3

Correct Answer: b) 5

Justification: 5 is greater than 2, 1, and 3.

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Class Two Math Past Paper

Correct Answer: c) 3

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Justification: We add 2 each time: 2, 4, 6, 8.

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- a) 12
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- d) 15

Correct Answer: d) 15

Justification: $5 + 5 = 10$ and $10 + 5 = 15$.

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- c) 5
- d) 6

Correct Answer: b) 4

Justification: There are 4 boxes

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Class Two Math Past Paper

- c) 6
- d) 7

Correct Answer: b) 5

Justification: There are 5 balls.

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Correct Answer: c) 9

Justification: 9 comes between 8 and 10.

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Justification: One foot has 5 toes.

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Class Two Math Past Paper

- a) 10
- b) 13
- c) 14
- d) 15

Correct Answer: b) 13

Justification: 13 comes after 12.

17. What comes before 15?

- a) 13
- b) 14
- c) 16
- d) 17

Correct Answer: b) 14

Justification: 14 comes immediately before 15.

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- a) 19
- b) 20
- c) 22
- d) 23

Correct Answer: c) 22

Justification: 22 comes after 21.

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- b) 19
- c) 21
- d) 22

Correct Answer: b) 19

Justification: 19 comes immediately before 20.

Class Two Math Past Paper

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- a) 24
- b) 27
- c) 28
- d) 29

Correct Answer: b) 27

Justification: 27 comes after 26.

21. What comes before 30?

- a) 28
- b) 29
- c) 31
- d) 32

Correct Answer: b) 29

Justification: 29 comes immediately before 30.

22. What comes next? 31, 32, ____

- a) 30
- b) 33
- c) 34
- d) 35

Correct Answer: b) 33

Justification: 33 comes after 32.

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- d) 42

Correct Answer: b) 39

Justification: 39 is one less than 40.

Class Two Math Past Paper

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- b) 43
- c) 44
- d) 45

Correct Answer: b) 43

Justification: 43 comes immediately after 42.

25. What comes before 50?

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- b) 48
- c) 49
- d) 51

Correct Answer: c) 49

Justification: 49 comes immediately before 50.

26. What comes next? 5, 6, 7, ____

- a) 8
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- c) 10
- d) 11

Correct Answer: a) 8

Justification: The numbers increase by 1.

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- a) 8
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Class Two Math Past Paper

Correct Answer: b) 9

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- a) 17
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- c) 19
- d) 20

Correct Answer: a) 17

Justification: 17 comes after 16.

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- a) 22
- b) 23
- c) 24
- d) 26

Correct Answer: c) 24

Justification: 24 comes immediately before 25.

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- b) 22
- c) 23
- d) 24

Correct Answer: a) 21

Justification: 21 comes immediately after 20.

31. What is $2 + 3$?

- a) 4
- b) 5

Class Two Math Past Paper

- c) 6
- d) 7

Correct Answer: b) 5

Justification: $2 + 3 = 5$.

32. What is $5 + 4$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $5 + 4 = 9$.

33. What is $7 - 2$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $7 - 2 = 5$.

34. What is $9 - 4$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $9 - 4 = 5$.

35. What is $6 + 2$?

Class Two Math Past Paper

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: b) 8

Justification: $6 + 2 = 8$.

36. What is $10 - 3$?

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: c) 7

Justification: $10 - 3 = 7$.

37. What is $4 + 5$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $4 + 5 = 9$.

38. What is $8 - 3$?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $8 - 3 = 5$.

Class Two Math Past Paper

39. Ali has 3 pencils. His friend gives him 2 more. How many pencils does Ali have?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: b) 5

Justification: $3 + 2 = 5$ pencils.

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- a) 4
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- c) 6
- d) 7

Correct Answer: b) 5

Justification: $8 - 3 = 5$ candies.

41. What is $1 + 7$?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: c) 8

Justification: $1 + 7 = 8$.

42. What is $10 - 6$?

- a) 3
- b) 4
- c) 5
- d) 6

Correct Answer: b) 4

Justification: $10 - 6 = 4$.

Class Two Math Past Paper

43. There are 4 birds on a tree. 3 more birds come. How many birds are there now?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: b) 7

Justification: $4 + 3 = 7$ birds.

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- c) 8
- d) 9

Correct Answer: b) 7

Justification: $9 - 2 = 7$ balloons.

45. What is $3 + 6$?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $3 + 6 = 9$.

46. What is $7 - 5$?

- a) 1
- b) 2
- c) 3
- d) 4

Class Two Math Past Paper

Correct Answer: b) 2

Justification: $7 - 5 = 2$.

47. What is $5 + 5$?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: c) 10

Justification: $5 + 5 = 10$.

48. What is $12 - 2$?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: c) 10

Justification: $12 - 2 = 10$.

49. Hamza has 6 toy cars. He gets 3 more. How many toy cars does he have?

- a) 8
- b) 9
- c) 10
- d) 11

Correct Answer: b) 9

Justification: $6 + 3 = 9$ toy cars.

50. There are 11 flowers. 5 are picked. How many flowers remain?

- a) 5
- b) 6

Class Two Math Past Paper

c) 7

d) 8

Correct Answer: b) 6

Justification: $11 - 5 = 6$ flowers.

Class 3rd Math Past Paper

1. What is the place value of 6 in 4,682?

- a) 6
- b) 60
- c) 600
- d) 6,000

Correct Answer: c

2. Which number is written as “three thousand forty-five”?

- a) 3,405
- b) 3,045
- c) 3,450
- d) 3,054

Correct Answer: b

3. Which is the greatest number?

- a) 2,789
- b) 2,798
- c) 2,879
- d) 2,897

Correct Answer: d

4. What number comes immediately after 4,999?

- a) 4,998
- b) 5,000
- c) 5,001
- d) 4,900

Correct Answer: b) 5,000

5. Which expanded form represents 7,306?

Class 3rd Math Past Paper

- a) $7,000 + 300 + 6$
- b) $7,000 + 30 + 6$
- c) $700 + 300 + 6$
- d) $7,000 + 306 + 60$

Correct Answer: a) $7,000 + 300 + 6$

6. Which number is the smallest?

- a) 5,201
- b) 5,021
- c) 5,210
- d) 5,120

Correct Answer: b) 5,021

7. What is the digit in the tens place of 8,472?

- a) 8
- b) 4
- c) 7
- d) 2

Correct Answer: c) 7

Justification: In 8,472, the digits represent thousands, hundreds, tens, and ones respectively.

8. What is $348 + 275$?

- a) 613
- b) 623
- c) 633
- d) 623

Correct Answer: b) 623

Justification: $348 + 275 = 623$.

9. Find: $805 - 367$

- a) 428
- b) 438
- c) 448
- d) 458

Correct Answer: b) 438

Justification: $805 - 367 = 438$.

Class 3rd Math Past Paper

10. Sara has 125 stickers and receives 78 more. How many stickers does she have?

- a) 193
- b) 203
- c) 213
- d) 223

Correct Answer: b) 203

Justification: $125 + 78 = 203$.

11. A shop had 500 pencils and sold 246. How many pencils remained?

- a) 244
- b) 254
- c) 264
- d) 274

Correct Answer: b) 254

Justification: $500 - 246 = 254$.

12. Which number should replace the box?

$$\square + 145 = 300$$

- a) 145
- b) 155
- c) 165
- d) 175

Correct Answer: b) 155

Justification: $300 - 145 = 155$.

13. What is 7×6 ?

- a) 36
- b) 40
- c) 42
- d) 48

Class 3rd Math Past Paper

Correct Answer: c) 42

Justification: 7 groups of 6 equal 42.

14. What is $56 \div 7$?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: c) 8

Justification: $7 \times 8 = 56$, so $56 \div 7 = 8$.

15. A teacher has 36 books and puts them equally into 4 boxes. How many books go in each box?

- a) 7
- b) 8
- c) 9
- d) 10

Correct Answer: c) 9

Justification: $36 \div 4 = 9$.

16. A pizza is divided into 8 equal pieces. Ali eats 3 pieces. What fraction did he eat?

- a) $\frac{3}{5}$
- b) $\frac{3}{8}$
- c) $\frac{5}{8}$
- d) $\frac{8}{3}$

Correct Answer: b) $\frac{3}{8}$

Justification: 3 pieces out of 8 equal pieces were eaten.

17. Which fraction represents one-half?

- a) $\frac{1}{3}$
- b) $\frac{2}{4}$

Class 3rd Math Past Paper

- c) $\frac{3}{5}$
- d) $\frac{1}{4}$

Correct Answer: b) $\frac{2}{4}$

Justification: $\frac{2}{4}$ is equivalent to $\frac{1}{2}$.

18. Which fraction is greater?

- a) $\frac{1}{4}$
- b) $\frac{1}{8}$
- c) $\frac{1}{10}$
- d) $\frac{1}{12}$

Correct Answer: a) $\frac{1}{4}$

Justification: When numerators are the same, the fraction with the smaller denominator is greater.

19. What is $\frac{2}{6} + \frac{3}{6}$?

- a) $\frac{4}{6}$
- b) $\frac{5}{6}$
- c) $\frac{5}{12}$
- d) $\frac{6}{5}$

Correct Answer: b) $\frac{5}{6}$

Justification: Add the numerators because the denominators are the same: $2 + 3 = 5$.

20. Which fraction means “five out of nine”?

- a) $\frac{9}{5}$
- b) $\frac{5}{9}$
- c) $\frac{4}{9}$
- d) $\frac{5}{4}$

Correct Answer: b) $\frac{5}{9}$

Justification: The numerator tells how many are taken, while the denominator tells the total equal parts.

Class 3rd Math Past Paper

21. What fraction of 10 apples is 4 apples?

- a) $\frac{4}{10}$
- b) $\frac{10}{4}$
- c) $\frac{6}{10}$
- d) $\frac{4}{6}$

Correct Answer: a) $\frac{4}{10}$

Justification: There are 4 apples out of 10.

22. Which fraction is equivalent to $\frac{1}{3}$?

- a) $\frac{2}{5}$
- b) $\frac{2}{6}$
- c) $\frac{3}{6}$
- d) $\frac{3}{9}$

Correct Answer: b) $\frac{2}{6}$

Justification: Multiplying both 1 and 3 by 2 gives $\frac{2}{6}$.

23. Which unit is most suitable for measuring the length of a pencil?

- a) Kilometre
- b) Metre
- c) Centimetre
- d) Litre

Correct Answer: c) Centimetre

Justification: A pencil is a small object, so centimetres are appropriate.

24. How many centimetres are in 1 metre?

- a) 10
- b) 50
- c) 100
- d) 1,000

Correct Answer: c) 100

Justification: 1 metre = 100 centimetres.

Class 3rd Math Past Paper

25. Which unit would be most suitable for measuring the distance between two cities?

- a) Centimetre
- b) Metre
- c) Kilometre
- d) Millilitre

Correct Answer: c) Kilometre

Justification: Large distances are measured in kilometres.

26. Which is heavier?

- a) 500 g
- b) 1 kg
- c) 750 g
- d) 250 g

Correct Answer: b) 1 kg

Justification: 1 kg = 1,000 g, which is greater than the other amounts.

27. How many grams are in 2 kilograms?

- a) 200 g
- b) 500 g
- c) 1,000 g
- d) 2,000 g

Correct Answer: d) 2,000 g

Justification: 1 kg = 1,000 g, so 2 kg = 2,000 g.

28. Which unit is best for measuring the amount of water in a bottle?

- a) Kilogram
- b) Litre
- c) Metre
- d) Centimetre

Class 3rd Math Past Paper

Correct Answer: b) Litre

Justification: Litres are commonly used to measure liquid capacity.

29. A jug contains 2 litres of water. If 1 litre is poured out, how much remains?

- a) 500 mL
- b) 1 litre
- c) 2 litres
- d) 3 litres

Correct Answer: b) 1 litre

Justification: $2 \text{ litres} - 1 \text{ litre} = 1 \text{ litre}$.

30. The minute hand points at 6 and the hour hand is between 3 and 4. What time is it?

- a) 3:06
- b) 3:30
- c) 6:15
- d) 4:30

Correct Answer: b) 3:30

Justification: The minute hand at 6 represents 30 minutes, and the hour is 3.

31. How many minutes are there in 1 hour?

- a) 30
- b) 45
- c) 60
- d) 100

Correct Answer: c) 60

Justification: One hour contains 60 minutes.

32. If a class starts at 9:00 a.m. and ends at 10:00 a.m., how long is the class?

- a) 30 minutes
- b) 45 minutes

Class 3rd Math Past Paper

- c) 1 hour
- d) 2 hours

Correct Answer: c) 1 hour

Justification: From 9:00 to 10:00 is exactly one hour.

33. What time is 45 minutes after 2:15?

- a) 2:45
- b) 3:00
- c) 3:15
- d) 3:30

Correct Answer: b) 3:00

Justification: $2:15 + 45 \text{ minutes} = 3:00$.

34. Which month comes immediately after September?

- a) August
- b) October
- c) November
- d) December

Correct Answer: b) October

Justification: October follows September in the calendar.

35. How many days are there in one week?

- a) 5
- b) 6
- c) 7
- d) 8

Correct Answer: c) 7

Justification: A week has seven days.

36. If today is Tuesday, what day will it be after 3 days?

Class 3rd Math Past Paper

- a) Wednesday
- b) Thursday
- c) Friday
- d) Saturday

Correct Answer: c) Friday

Justification: Wednesday is 1 day later, Thursday 2 days later, and Friday 3 days later.

37. A movie begins at 4:20 p.m. and lasts 1 hour. At what time does it end?

- a) 5:00 p.m.
- b) 5:10 p.m.
- c) 5:20 p.m.
- d) 6:20 p.m.

Correct Answer: c) 5:20 p.m.

Justification: Adding one hour to 4:20 gives 5:20.

38. How many sides does a triangle have?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b) 3

Justification: A triangle has three sides.

39. Which shape has exactly four equal sides?

- a) Rectangle
- b) Triangle
- c) Square
- d) Oval

Correct Answer: c) Square

Justification: A square has four equal sides.

Class 3rd Math Past Paper

40. Which 3-D object has two circular faces and one curved surface?

- a) Cube
- b) Cylinder
- c) Cone
- d) Sphere

Correct Answer: b) Cylinder

Justification: A cylinder has two circular flat faces and one curved surface.

41. Which object is shaped most like a ball?

- a) Cube
- b) Cone
- c) Sphere
- d) Cylinder

Correct Answer: c) Sphere

Justification: A ball has a spherical shape.

42. How many vertices (corners) does a cube have?

- a) 4
- b) 6
- c) 8
- d) 12

Correct Answer: c) 8

Justification: A cube has 8 vertices.

43. Which figure has no straight sides?

- a) Square
- b) Triangle
- c) Circle
- d) Rectangle

Correct Answer: c) Circle

Justification: A circle has a curved boundary and no straight sides.

Class 3rd Math Past Paper

44. An angle that looks like the corner of a square is called a:

- a) Acute angle
- b) Right angle
- c) Straight angle
- d) Curved angle

Correct Answer: b) Right angle

Justification: The corners of a square are right angles measuring 90° .

45. Which statement about a line is correct?

- a) It has only one endpoint
- b) It has two endpoints
- c) It extends endlessly in both directions
- d) It is always curved

Correct Answer: c) It extends endlessly in both directions

Justification: A mathematical line continues without an endpoint in both directions.

46. A class recorded the number of books read by four students:

Student Books

Ali	4
Sara	7
Hamza	5
Ayesha	6

Who read the most books?

- a) Ali
- b) Sara
- c) Hamza
- d) Ayesha

Correct Answer: b) Sara

Justification: Sara read 7 books, the highest number in the table.

Class 3rd Math Past Paper

47. The numbers of pencils collected by four groups are 8, 5, 10, and 7. How many pencils were collected altogether?

- a) 25
- b) 28
- c) 30
- d) 32

Correct Answer: b) 30

Justification: $8 + 5 + 10 + 7 = 30$.

48. A pictograph shows:

★ = 2 students

Ali's group: ★★★★★

How many students are in Ali's group?

- a) 6
- b) 8
- c) 10
- d) 12

Correct Answer: b) 8

Justification: $4 \text{ symbols} \times 2 \text{ students} = 8 \text{ students}$.

49. A survey shows children's favourite fruits:

Fruit	Number of Children
Apple	8
Mango	12
Banana	6
Orange	9

How many more children chose mango than banana?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: c) 6

Justification: $12 - 6 = 6$.

Class 3rd Math Past Paper

50. The marks of five students are 6, 8, 7, 8, and 9. Which mark occurred most often?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: c) 8

Justification: 8 appears twice, while every other number appears once.

Class 4th Math Past Paper

1. What is the value of 7×9 ?

- a) 56
- b) 63
- c) 72
- d) 81

Correct Answer: b

2. Which of the following is a prime number?

- a) 1
- b) 4
- c) 7
- d) 10

Correct Answer: c

3. What is the area of a rectangle with a length of 5 units and a width of 8 units?

- a) 10 square units
- b) 13 square units
- c) 40 square units
- d) 64 square units

Correct Answer: c

4. If a clock reads 3:45, what is the angle between the hour and minute hands?

- a) 45 degrees
- b) 90 degrees
- c) 180 degrees
- d) None of these

Correct Answer: d

5. Which fraction is equivalent to $\frac{3}{4}$?

- a) $\frac{1}{2}$
- b) $\frac{2}{3}$
- c) $\frac{6}{8}$
- d) $\frac{4}{5}$

Correct Answer: c

6. What is the next number in the pattern: 2, 5, 8, 11, ___?

- a) 14
- b) 15
- c) 18
- d) 20

Class 4th Math Past Paper

Correct Answer: a

7. If a book costs \$12, and you have \$20, how much change will you get?

- a) \$8
- b) \$10
- c) \$12
- d) \$15

Correct Answer: a

8. How many sides does a triangle have?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b

9. If you add 6 and 9, what is the result?

- a) 12
- b) 15
- c) 18
- d) 21

Correct Answer: b

10. What is the value of 3 squared (3^2)?

- a) 6
- b) 9
- c) 12
- d) 15

Correct Answer: b

11. Which of the following is a right angle?

- a) 45 degrees
- b) 90 degrees
- c) 120 degrees
- d) 180 degrees

Correct Answer: b

12. If you have 3 apples and you eat 2 of them, how many apples do you have left?

- a) 0
- b) 1

Class 4th Math Past Paper

c) 2

d) 3

Correct Answer: b

13. What is the perimeter of a square with sides of length 6 units?

a) 12 units

b) 18 units

c) 24 units

d) 36 units

Correct Answer: c

14. If a dozen eggs cost \$4, how much does one egg cost?

a) \$0.25

b) \$0.33

c) \$0.50

d) \$1.00

Correct Answer: b

15. Which of the following is not a polygon?

a) Triangle

b) Circle

c) Square

d) Hexagon

Correct Answer: b

16. If you count by 5s starting from 5, what is the fifth number?

a) 10

b) 15

c) 20

d) 25

Correct Answer: d

17. What is the product of 8 and 7?

a) 14

b) 48

c) 56

d) 64

Correct Answer: c

18. Which fraction is greater: $\frac{2}{5}$ or $\frac{3}{8}$?

Class 4th Math Past Paper

- a) $\frac{2}{5}$
- b) $\frac{3}{8}$
- c) They are equal

Correct Answer: a

19. What is the sum of 17 and 28?

- a) 35
- b) 45
- c) 55
- d) 65

Correct Answer: b

20. How many sides does a hexagon have?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: c

21. What is the next number in the pattern: 10, 14, 18, 22, ___?

- a) 24
- b) 26
- c) 28
- d) 30

Correct Answer: b

22. How many centimeters are in a meter?

- a) 10
- b) 100
- c) 1000
- d) 10,000

Correct Answer: b

23. Which of the following is a prime number?

- a) 6
- b) 9
- c) 13
- d) 16

Correct Answer: c

Class 4th Math Past Paper

24. If you have $\frac{2}{3}$ of a pizza and you eat $\frac{1}{4}$ of it, how much pizza is left?

- a) $\frac{1}{4}$
- b) $\frac{1}{3}$
- c) $\frac{5}{12}$
- d) $\frac{2}{3}$

Correct Answer: c

25. What is the perimeter of a triangle with sides measuring 6 cm, 8 cm, and 10 cm?

- a) 12 cm
- b) 20 cm
- c) 24 cm
- d) 30 cm

Correct Answer: c

26. If you multiply 3 by 5, what is the result?

- a) 8
- b) 10
- c) 12
- d) 15

Correct Answer: d

27. How many sides does an octagon have?

- a) 6
- b) 7
- c) 8
- d) 9

Correct Answer: c

28. What is the value of 9×7 ?

- a) 56
- b) 63
- c) 72
- d) 81

Correct Answer: b

29. If a clock reads 6:30, what is the angle between the hour and minute hands?

- a) 45 degrees
- b) 90 degrees
- c) 135 degrees
- d) None of these

Class 4th Math Past Paper

Correct Answer: d

30. Which fraction is equivalent to $\frac{4}{6}$?

- a) $\frac{1}{2}$
- b) $\frac{2}{3}$
- c) $\frac{3}{5}$
- d) $\frac{5}{8}$

Correct Answer: b

31. What is $\frac{2}{5}$ of 25?

- a) 5
- b) 10
- c) 12
- d) 15

Correct Answer: b

32. How many millimeters are in a meter?

- a) 10
- b) 100
- c) 1000
- d) 10,000

Correct Answer: c

33. What is the sum of 48 and 27?

- a) 65
- b) 75
- c) 85
- d) 95

Correct Answer: b

34. What is the difference between 72 and 39?

- a) 21
- b) 31
- c) 33
- d) 42

Correct Answer: c

35. If you add $\frac{1}{3}$ and $\frac{2}{3}$, what is the sum?

- a) $\frac{1}{3}$
- b) $\frac{1}{2}$

Class 4th Math Past Paper

c) $\frac{2}{3}$

d) 1

Correct Answer: d

36. Which of the following is the largest prime number?

a) 2

b) 3

c) 5

d) 7

Correct Answer: d

37. How many sides does a heptagon have?

a) 4

b) 5

c) 6

d) 7

Correct Answer: d

38. If you count by 5s starting from 5, what is the fourth number?

a) 10

b) 15

c) 20

d) 25

Correct Answer: c

39. What are 6 squared?

a) 12

b) 24

c) 36

d) 48

Correct Answer: c

40. If you have 4 quarters, how much money do you have?

a) \$0.25

b) \$0.50

c) \$1.00

d) \$2.00

Correct Answer: c

41. What is the next number in the pattern: 3, 6, 9, 12, ___?

Class 4th Math Past Paper

- a) 15
- b) 18
- c) 21
- d) 24

Correct Answer: a

42. What is $\frac{2}{4}$ simplified to its lowest terms?

- a) $\frac{1}{2}$
- b) $\frac{2}{3}$
- c) $\frac{3}{4}$
- d) $\frac{4}{5}$

Correct Answer: a

43. If a book costs \$15, and you have \$20, how much change will you get?

- a) \$5
- b) \$10
- c) \$15
- d) \$20

Correct Answer: a

44. How many edges does a cube have?

- a) 4
- b) 6
- c) 8
- d) 12

Correct Answer: d

45. What is the area of a circle with a radius of 5 units?

- a) $\pi 10$ square units
- b) $\pi 15$ square units
- c) $\pi 20$ square units
- d) $\pi 25$ square units

Correct Answer: d

46. Which of the following is not a prime number?

- a) 1
- b) 2
- c) 3
- d) 7

Correct Answer: a

Class 4th Math Past Paper

47. What is the sum of the first ten counting numbers ($1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10$)?

- a) 45
- b) 50
- c) 55
- d) 60

Correct Answer: c

48. A circle has _____ lines of symmetry.

- a) Finite
- b) Infinite
- c) Zero
- d) None

Correct Answer: b

49. What is the sum of the first five counting numbers ($1 + 2 + 3 + 4 + 5$)?

- a) 10
- b) 15
- c) 20
- d) 25

Correct Answer: b

50. What is the product of 5 and 9?

- a) 14
- b) 40
- c) 45
- d) 54

Correct Answer: c

Class 5th Math Past Paper

1. If a dozen donuts cost \$6, how much does one donut cost?

- A) \$0.25
- B) \$0.50
- C) \$1.00
- D) \$2.00

Correct Answer: B

2. What is the value of 9×7 ?

- A) 14
- B) 56
- C) 63
- D) 72

Correct Answer: C

3. If a rectangle has a length of 10 units and a width of 3 units, what is its area?

- A) 7 square units
- B) 13 square units
- C) 20 square units
- D) 30 square units

Correct Answer: D

4. Which of the following fractions is equivalent to $\frac{3}{4}$?

- A) $\frac{1}{4}$
- B) $\frac{2}{4}$
- C) $\frac{2}{3}$
- D) None of these

Correct Answer: D

5. If you divide 36 by 4, what is the result?

- A) 6
- B) 9
- C) 12
- D) 16

Correct Answer: B

6. What is the next term in the pattern: 5, 10, 15, 20, ___?

- A) 24
- B) 25
- C) 30
- D) 35

Correct Answer: B

7. If a clock shows 2:30, how many degrees does the minute hand make with the 12 o'clock position?

- A) 45 degrees
- B) 90 degrees
- C) 120 degrees
- D) None of these

Correct Answer: D

8. Which of the following is a composite number?

- A) 2
- B) 3
- C) 4
- D) 5

Class 5th Math Past Paper

Correct Answer: C

9. What is $\frac{1}{5}$ as a decimal?

- A) 0.05
- B) 0.1
- C) 0.2
- D) 0.5

Correct Answer: C

10. If a square has an area of 25 square units, what is the length of one of its sides?

- A) 5 units
- B) 10 units
- C) 15 units
- D) 25 units

Correct Answer: A)

11. If you add $\frac{1}{4}$ and $\frac{3}{4}$, what is the result?

- A) $\frac{1}{2}$
- B) $\frac{1}{4}$
- C) $\frac{1}{8}$
- D) 1

Correct Answer: D

12. How many centimeters are in 1 meter?

- A) 10 cm
- B) 100 cm
- C) 1000 cm
- D) 10000 cm

Correct Answer: B

13. What is the value of 5^3 (5 to the power of 3)?

- A) 15
- B) 25
- C) 125
- D) 625

Correct Answer: C

14. If you have $\frac{5}{6}$ of a pizza, how much is left as a fraction?

- A) $\frac{1}{6}$
- B) $\frac{1}{3}$
- C) $\frac{2}{3}$
- D) $\frac{5}{6}$

Correct Answer: A

15. Which of the following is an obtuse angle?

- A) 45 degrees
- B) 90 degrees
- C) 95 degrees
- D) 160 degrees

Correct Answer: D

16. If you subtract 17 from 42, what is the result?

- A) 15
- B) 25

Class 5th Math Past Paper

C) 35

D) 59

Correct Answer: B

17. What is the value of $\frac{1}{3}$ divided by $\frac{1}{4}$?

A) $\frac{1}{7}$

B) $\frac{1}{12}$

C) $\frac{4}{3}$

D) $\frac{3}{4}$

Correct Answer: C

18. If you have a hexagon, how many sides does it have?

A) 4

B) 5

C) 6

D) 7

Correct Answer: C

19. If you multiply 9 by 7, what is the result?

A) 14

B) 54

C) 63

D) 72

Correct Answer: C

20. What is the area of a rectangle with a length of 7 units and a width of 4 units?

A) 11 square units

B) 21 square units

C) 28 square units

D) 56 square units

Correct Answer: C

21. If you have 3 dozen apples, how many apples do you have?

A) 12

B) 24

C) 36

D) 48

Correct Answer: C

22. What is the next number in this pattern: 1, 3, 6, 10, ___?

A) 12

B) 15

C) 18

D) 21

Correct Answer: B

23. If you add $\frac{5}{8}$ and $\frac{2}{8}$, what is the result?

A) $\frac{1}{8}$

B) $\frac{3}{8}$

C) $\frac{5}{8}$

D) $\frac{7}{8}$

Class 5th Math Past Paper

Correct Answer: D

24. What is $\frac{3}{5}$ as a decimal?

- A) 0.3
- B) 0.5
- C) 0.6
- D) 0.75

Correct Answer: C

25. What is the sum of 11 and -6?

- A) 5
- B) 6
- C) 17
- D) -17

Correct Answer: A

26. If a triangle has all sides of different lengths, what type of triangle is it?

- A) Equilateral
- B) Isosceles
- C) Scalene
- D) Right triangle

Correct Answer: C

27. If you subtract 8 from 15, what is the result?

- A) 7
- B) 8
- C) 15
- D) 23

Correct Answer: A

28. How many faces does a cube have?

- A) 4
- B) 5
- C) 6
- D) 8

Correct Answer: C

29. What is the value of 4 squared (4^2)?

- A) 8
- B) 12
- C) 16
- D) 24

Correct Answer: C

30. If a recipe calls for $\frac{1}{2}$ cup of flour and you want to make 3 times the recipe, how much flour will you need?

- A) $\frac{1}{6}$ cup

Class 5th Math Past Paper

- B) 1/2 cup
- C) 1.5 cups
- D) 3 cups

Correct Answer: C

31. If you have 3 nickels and 2 quarters, how much money do you have in total (in cents)?

- A) 15 cents
- B) 25 cents
- C) 65 cents
- D) 50 cents

Correct Answer: C

32. What is the next term in the pattern: 4, 9, 16, 25, ___?

- A) 32
- B) 36
- C) 49
- D) 64

Correct Answer: B

33. If you multiply 5 by 7, what is the result?

- A) 10
- B) 25
- C) 30
- D) 35

Correct Answer: D

34. Which of the following is the largest prime number?

- A) 3
- B) 7
- C) 11
- D) 15

Correct Answer: C

35. What is the product of 9 and 6?

- A) 15
- B) 36
- C) 54
- D) 63

Correct Answer: C

36. If a rectangle has a length of 14 units and a width of 9 units, what is its perimeter?

- A) 5 units
- B) 18 units
- C) 46 units
- D) 32 units

Correct Answer: C

Class 5th Math Past Paper

37. What is $\frac{2}{3}$ as a decimal?

- A) 0.2
- B) 0.333
- C) 0.5
- D) 0.666

Correct Answer: D

38. If a clock shows 9:15, how many degrees does the minute hand make with the 12 o'clock position?

- A) 45 degrees
- B) 90 degrees
- C) 105 degrees
- D) 180 degrees

Correct Answer: B

39. Which of the following is a prime number?

- A) 6
- B) 8
- C) 11
- D) 14

Correct Answer: C

40. What is the next term in the pattern: 1, 4, 9, 16, ___?

- A) 24
- B) 25
- C) 36
- D) 49

Correct Answer: B

41. If you add $\frac{2}{5}$ and $\frac{3}{5}$, what is the result?

- A) $\frac{1}{10}$
- B) $\frac{1}{2}$
- C) $\frac{5}{10}$
- D) 1

Correct Answer: D

42. What is the smallest prime number?

- A) 0
- B) 1
- C) 2
- D) 3

Correct Answer: C)

43. If a book has 240 pages, and you read 60 pages, what fraction of the book have you read?

- A) $\frac{1}{4}$
- B) $\frac{1}{3}$
- C) $\frac{1}{2}$
- D) $\frac{3}{4}$

Class 5th Math Past Paper

Correct Answer: A

44. If the temperature is -10 degrees Celsius and it increases by 15 degrees, what is the new temperature?

- A) 5 degrees
- B) 10 degrees
- C) 15 degrees
- D) 25 degrees

Correct Answer: A

45. What is the value of 2 to the power of 4 (2^4)?

- A) 6
- B) 8
- C) 12
- D) 16

Correct Answer: D

46. If you have 4 quarters, 3 dimes, and 2 nickels, how much money do you have in total (in cents)?

- A) 50 cents
- B) 65 cents
- C) 75 cents
- D) 140 cents

Correct Answer: D

47. Which of the following fractions is the largest?

- A) $\frac{1}{4}$
- B) $\frac{3}{5}$
- C) $\frac{5}{8}$
- D) $\frac{2}{3}$

Correct Answer: D

48. What is the sum of $\frac{7}{8}$ and $\frac{3}{8}$?

- A) $\frac{4}{8}$
- B) $\frac{5}{8}$
- C) $\frac{6}{8}$
- D) $\frac{10}{8}$

Correct Answer: D

49. If you add 15 to -8, what is the result?

- A) 7
- B) 8
- C) 15
- D) -23

Correct Answer: A

50. If you have a right triangle, and the lengths of its two shorter sides (legs) are 6 units and 8 units, what is the length of the hypotenuse?

Class 5th Math Past Paper

A) 10 units

B) 12 units

C) 14 units

D) 16 units

Correct Answer: A

Class 6th Math Past Paper

1. What is the Highest Common Factor (HCF) of 12 and 18?

- A) 3
- B) 6
- C) 12
- D) 1

Answer: B

2. If the length and width of a rectangle are 8 cm and 6 cm, what is the area of the parallelogram formed?

- A) 14 cm^2
- B) 48 cm^2
- C) 24 cm^2
- D) 60 cm^2

Answer: B

3. In a trapezium, the bases have lengths of 5 cm and 8 cm, and the height is 4 cm. What is the area of the trapezium?

- A) 24 cm^2
- B) 26 cm^2
- C) 34 cm^2
- D) 36 cm^2

Answer: B

4. In a right-angled triangle, if the length of the two shorter sides (legs) is 3 cm and 4 cm, what is the length of the hypotenuse?

- A) 5 cm
- B) 7 cm
- C) 8 cm
- D) 9 cm

Answer: A)

5. Simplify the expression: $2x - (3x - 5)$.

- A) $-x + 5$
- B) $x - 5$
- C) $-5x + 5$
- D) $8 - x$

Answer: A

6. If a car travels at a speed of 60 km/h, how long does it take to cover a distance of 120 kilometers?

- A) 1 hour
- B) 2 hours
- C) 3 hours
- D) 4 hours

Answer: B

Class 6th Math Past Paper

7. If the ratio of boys to girls in a classroom is 3:2, and there are 15 girls, how many boys are there?

- A) 9
- B) 10
- C) 12
- D) 7.5

Answer: C

8. Which of the following is a quadrilateral with all sides of equal length and all angles of 90 degrees?

- A) Square
- B) Rectangle
- C) Rhombus
- D) Parallelogram

Answer: A

9. A polygon with 6 sides is called a:

- A) Hexagon
- B) Octagon
- C) Pentagon
- D) Heptagon

Answer: A

10. The formula for the area of a circle is:

- A) $A = \pi r^2$
- B) $A = 2\pi r$
- C) $A = 1/2\pi r^2$
- D) $A = \pi r$

Answer: A

11. What is the Least Common Multiple (LCM) of 6 and 8?

- A) 24
- B) 48
- C) 12
- D) 18

Answer: A

12. If the base of a parallelogram is 10 cm, and the height is 7 cm, what is its area?

- A) 17 cm²
- B) 70 cm²
- C) 35 cm²
- D) 10 cm²

Answer: B

13. In a right-angled triangle, if one leg is 5 cm and the hypotenuse is 13 cm, what is the length of the other leg?

Class 6th Math Past Paper

- A) 7 cm
- B) 8 cm
- C) 12 cm
- D) 9 cm

Answer: C

14. Simplify the expression: $4(x + 2) - 3(2x - 1)$.

- A) $5x + 11$
- B) $7x - 8$
- C) $2x + 7$
- D) None of these

Answer: D

15. If a train travels at a speed of 80 km/h for 2.5 hours, how far does it travel?

- A) 160 km
- B) 200 km
- C) 180 km
- D) 250 km

Answer: B

16. The ratio of apples to oranges in a basket is 4:3. If there are 28 apples, how many oranges are there?

- A) 21
- B) 14
- C) 12
- D) 24

Answer: A

17. A four-sided polygon with only one pair of parallel sides is called a:

- A) Square
- B) Rectangle
- C) Trapezium
- D) Rhombus

Answer: C

18. A polygon with 8 sides is called a:

- A) Octagon
- B) Decagon
- C) Hexagon
- D) Heptagon

Answer: A

19. If the circumference of a circle is 20π cm, what is its radius?

- A) 10 cm
- B) 5 cm
- C) 20 cm

Class 6th Math Past Paper

D) 5π cm

Answer: B

20. What is the formula for the volume of a cube with side length "a"?

A) $V = a^2$

B) $V = 6a^2$

C) $V = a^3$

D) $V = 4a^2$

Answer: C

21. What is the value of $\frac{4}{5} + \frac{3}{4}$?

A) $1 \frac{3}{20}$

B) $\frac{7}{20}$

C) $1 \frac{7}{20}$

D) $1 \frac{1}{4}$

Answer: A

22. If the area of a square is 49 square units, what is the length of one side of the square?

A) 7 units

B) 14 units

C) 21 units

D) 56 units

Answer: A

23. What is the product of 7.8 and 6.4?

A) 49.92

B) 50.32

C) 48.42

D) 45.12

Answer: A

24. If a number is increased by 20% and the result is 72, what is the original number?

A) 60

B) 65

C) 70

D) 75

Answer: A

25. The perimeter of a rectangle is 32 cm, and its length is 10 cm. What is the width of the rectangle?

A) 6 cm

B) 7 cm

C) 8 cm

D) 12 cm

Answer: A

Class 6th Math Past Paper

26. If the ratio of boys to girls in a class is 3:2 and there are 15 girls, how many boys are there?

- A) 10
- B) 12
- C) 18
- D) None of these

Answer: D

27. What is the value of $(5^3) * (2^2)$?

- A) 200
- B) 125
- C) 250
- D) 225

Answer: A

28. A book originally costs \$40, but it is on sale for 25% off. What is the sale price of the book?

- A) \$10
- B) \$20
- C) \$30
- D) \$35

Answer: C

29. If 20% of a number is 24, what is the number?

- A) 100
- B) 120
- C) 80
- D) 96

Answer: B

30. If the area of a triangle is 36 square units, and the base is 12 units, what is the height of the triangle?

- A) 3 units
- B) 4 units
- C) 6 units
- D) 8 units

Answer: B

31. If 15% of a number is 45, what is the number?

- A) 150
- B) 200
- C) 250
- D) 300

Answer: D

Class 6th Math Past Paper

32. A shirt is originally priced at \$40. It is on sale for 20% off. What is the sale price of the shirt?

- A) \$8
- B) \$32
- C) \$36
- D) \$44

Answer: B

33. If you score 80 out of 100 on a test, what is your score as a percentage?

- A) 80%
- B) 20%
- C) 0.8%
- D) 8%

Answer: A

34. If a computer is discounted by 15% and its sale price is \$850, what was the original price?

- A) \$950
- B) \$900
- C) \$1,000
- D) \$765

Answer: C

35. If a jacket is marked down by 30% and its sale price is \$70, what was the original price of the jacket?

- A) \$105
- B) \$100
- C) \$85
- D) \$77

Answer: B

36. What is 5% of 240?

- A) 24
- B) 12
- C) 120
- D) 60

Answer: B

37. If 25% of a solution is alcohol, and the solution contains 200 milliliters of alcohol, what is the total volume of the solution?

- A) 500 ml
- B) 400 ml
- C) 800 ml
- D) 1000 ml

Answer: B

Class 6th Math Past Paper

38. A student answered 80% of the questions correctly on a test. If there were 50 questions, how many did the student answer correctly?

- A) 30
- B) 40
- C) 45
- D) 48

Answer: B

39. If a product's price is increased by 10%, and the new price is \$110, what was the original price?

- A) \$121
- B) \$100
- C) \$99
- D) \$1100

Answer: B

40. A store sells a shirt for \$25, which is 20% less than the regular price. What is the regular price of the shirt?

- A) \$30
- B) \$31.25
- C) \$35
- D) \$50

Answer: B

41. What is the surface area of a cube with a side length of 3 cm?

- A) 6 cm^2
- B) 9 cm^2
- C) 12 cm^2
- D) None of these

Answer: D

42. If the edge length of a cube is 5 cm, what is its total surface area?

- A) 25 cm^2
- B) 125 cm^2
- C) 100 cm^2
- D) 50 cm^2

Answer: C

43. A cube has a surface area of 150 square units. What is the length of each side of the cube?

- A) 5 units
- B) 10 units
- C) 15 units
- D) 25 units

Answer: A

Class 6th Math Past Paper

44. How many significant figures are in the number 0.0076?

- A) 2
- B) 3
- C) 4
- D) 5

Answer: A

45. What is the result of $4.56 + 1.23$ (to the correct number of significant figures)?

- A) 5.79
- B) 5.79
- C) 5.8
- D) 5.79

Answer: B

46. How many significant figures are in the number 50001?

- A) 1
- B) 2
- C) 4
- D) 5

Answer: D

47. If you round 3.987 to the nearest tenth, what is the result?

- A) 3.9
- B) 3.98
- C) 3.987
- D) 4.0

Answer: A

48. When you truncate the number 6.789 to two decimal places, what is the result?

- A) 6.78
- B) 6.79
- C) 6.7
- D) 7.00

Answer: A

49. If you approximate 2.3456 to one decimal place, what is the value?

- A) 2.3
- B) 2.35
- C) 2.3456
- D) 2.4

Answer: A

50. What is the reciprocal of $\frac{3}{5}$?

- A) $\frac{3}{5}$
- B) $\frac{5}{3}$
- C) $\frac{8}{15}$

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D) $\frac{15}{8}$

Answer: B

CLASS 7TH MATH PAPER

1. $A \times B = B \times A$

- a) Commutative property
- b) Associative property
- c) Distributive property
- d) Inverse property

Answer : a)

2. Multiplicative inverse of $\frac{7}{4}$

is? a) $\frac{4}{7}$

b) $\frac{2}{4}$

c) $\frac{7}{4}$

d) $\frac{7}{7}$

Answer :

a)

3. Five eight of students at a college live in hostels. If 6000 students live in hostels, how many students are there in college?

a) 9400

b) 9500

c) 9600

d) 9800

Answer :

c)

4. $(-16)(-3) =$

a) 4.5

b) -9

c) 9

d) 48

Answer d)

5. A prime number when added to 101 gives an odd prime number. Guess the number?

a) 2

b) 3

c) 4

d) 5

Answer : a)

6. Square root of 100 is?

a) 31

b) 33

c) 10

d) 37

Answer : c)

7. Square root of 9801 is?

- a) 99
- b) 101
- c) 103
- d) 95

Answer : a)

8. Square root of 2116 is?

- a) 44
- b) 46
- c) 48
- d) 42

Answer : a

9. Square root of 4356 is?

- a) 46
- b) 56
- c) 66
- d) 78

Answer : c0

10. Area of a square park is 2500m^2 . Guess the perimeter of square park?

- a) 100m
- b) 200m
- c) 300m
- d) 50m

Answer

:b)

11. Let 5 liters of oil paint will cover 16m^2 & Herman is painting a square pattern, what is the length of square the oil paint will cover?

- a) 2m
- b) 4m
- c) 6m
- d) 12m

Answer :

b)

12. Length of rectangular region is double of its width. Guess perimeter if its area is 128cm^2 .

- a) 18cm
- b) 28cm
- c) 38cm
- d) 48cm

Answer :

d)

13. A composite number has?

- a) 1 factor
- b) 2 factors
- c) More than 2 factors
- d) None of

these

14. Twin primes differ by?

- a) 1
- b) 2
- c) 3

d) 4

Answer : b

15. The monthly rent of a stall is decreased in the ratio 5:6. As a result, the stall holder saves Rs.4000 a month. Guess the original rent?

a) 12000

b) 14000

c) 22000

d) 24000

Answer : d

16. A picture measuring 8.5 m by 5.5 m is enlarged in the ratio 7:5. Guess the dimensions of the new picture?

a) 11.9m, 7.7m

b) 12m, 8m

c) 9m, 6m

d) 10m, 9m

Answer :

a

17. Aeliya works 5 hours & earns \$1500. How much will she get for working 15 hours? a) 2000

b) 2500

c) 4000

d) 4500

Answer : d)

18. A recipe requires 2 glass of flour to make 12 butter milk biscuits. How much flour is needed to make 30 biscuits?

a) 2 glass

b) 3 glass

c) 4 glass

d) 5 glass

Answer : d)

19. A water tank can be emptied in 50 minutes by 5 pumps. How long will it take if 1 pump is out of order?

a) 62 min

b) 62.5 min

c) 63 min

d) 63.5 min

Answer : b)

20. A man bought a dining table for \$8500. He sold it at a loss of 10%. Guess sale price?

21. a) \$ 7600

b) \$ 7650

d) \$ 7750

Answer : b)

22. The marked price of a table is Rs. 800. It is sold at a discount of 16%. Guess the sale price? a) 671

b) 672

c) 673

d) 674

Answer: b)

23. A bicycle is sold for Rs. 12000 at a discount of 20%. Guess its marked price? a) 12000

b) 13000

c) 14000

d) 15000

Answer: d)

24. farjaad paid property tax worth Rs. 25800 for two plots at 2.4%. Guess the value of each plot. a) 537000

b) 537500

c) 538000

d) 538500

Answer: b)

25. Sale price of 5 pickle packs including GST is \$232. Guess the factory price of 1 pickle pack, if rate of GST is 16%.

a) 20

b) 40

c) 60

d) 80

Answer : b)

26. How much government revenue is collected by different taxes? a) 50%

b) 70%

c) 90%

d) 30%

Answer : b)

27. Guess Ushr on 850 g wheat irrigated by artificial resources & 740 g wheat irrigated by natural resources.

a) 116 g

b) 116.5 g

c) 117 g

d) 117.5 g

Answer : b)

28. Output tax – input tax =

a) Property tax

b) GST

c) Income tax

d) VAT

Answer :

d)

29. Guess the next term 7,14,21,28,...?

a) 35

b) 42

c) 49

d) 56

Answer : a)

30. Guess the next term 45, 33, 60, 44,75,...?

a) 90

b) 55

c) 50

d) 45

Answer: a

31. 8 is a polynomial of degree?

a) 0

b) 1

c) 2

d) 4

Answer : a)

32. All points lying on x-axis have y-coordinate ____if x & y are positive.

a) 0.5

b) 0

c) -1

d) 2

Answer : b)

33. (x,y) when lies in 4th quadrant has coordinates?

a) (-x,y)

b) (-x,-y)

c) (x,y)

d) (x,-y)

Answer :

d)

34. The coordinates of the points (x,0) when translated 2 units to right and 1 unit up?

a) X+2, 1

b) X-2,-1

c) X+2,-1

d) $x-2, 1$

Answer : a)

35. If $4x-20=2x+6$, then
 $x=?$

a) 12

b) 133

c) 14

d) 13

Answer : d)

36. Guess three consecutive odd numbers whose sum
is 57? a) 17, 17, 23

b) 17, 19, 21

c) 15, 17, 25

d) 17, 18, 22

Answer : b)

37. A linear equation in two variables always represents a?

a) Straight line

b) Triangle

c) Quadrilateral

d) Line
segment

Answer : a)

38. A polygon in which at least one of the angles is greater than 180 degree is called ?

a) Concave polygon

b) Convex polygon

c) Concave & convex polygon

d) None of
these

Answer: a)

39. The measure of exterior angle of a regular pentagon at each vertex is?

a) 71 degree

b) 72 degree

c) 75 degree

d) 90
degree

Answer:

b)

40. 180 degree is the angle of ?

a) Acute

b) Right

c) Obtuse

Answer: d)

41. Guess the circumference of a circle having a diameter 4.2cm?

- a) 13cm
- b) 15cm
- c) 13.2cm

d) 11.5cm

Answer :

c) 42. $0+(10)=$

a) 10

b) -10

c) 0

d) -0

Answer :

a) 43.

(40)+(50)+60=

a) 150

b) -25

c) 30

d) -30

Answer :a

44. $17+8-3 \times 2=$

a) 13

b) 15

c) 17

d) 19

Answer : d)

45. If A=Students in your class of age 5 years is a/an set?

a) Empty

b) Singleton

c) Infinite

d) Universal

Answer: a

46. Set of natural numbers between 1 & 3 is set?

a) Empty

b) Singleton

c) Infinite

d) Universal

Answer : b)

47. The co-efficient of xy in $3x+6xy+6yz$ is?

a) 3

b) 6

c) 9

d) -9

Answer : b)

48. 2,4,7,11,...,7th term is?

a) 29

c) 27

d) 26

Answer: a)

49. If 3 times a number is added to 18, it becomes 36. What is number?

a) 4

b) 5

c) 6

d) 7

Answer: c)

50. How many times do the area of a square increase when the length of its side is doubled?

a) $2x$

b) $4x$

c) $8x$

d) 16

x

An

sw

er

:

b)

Class 8th Math Past Paper

1. What is the median of the following set of numbers: 7, 5, 9, 2, 8?

- a) 5
- b) 7
- c) 8
- d) 9

Correct Answer: b)

2. Find the mode of the following data set: 3, 5, 2, 5, 6, 7, 5, 2, 8, 4.

- a) 5
- b) 2
- c) 8
- d) 6

Correct Answer: a)

3. Calculate the mean of the numbers 12, 8, 5, 15, and 10.

- a) 12
- b) 10
- c) 8
- d) 11

Correct Answer: b

4. In a school competition, the scores of 10 students out of 100 are as follows: 85, 92, 88, 95, 72, 88, 78, 92, 88, 90. What is the mode of the scores?

- a) 72
- b) 78
- c) 88
- d) 92

Correct Answer: c)

5. The following data represents the number of hours spent on homework by a group of students: 2, 3, 4, 5, 2, 2, 6, 7, 3. What is the mean number of hours spent on homework?

- a) 3
- b) 4
- c) 5
- d) 6

Correct Answer: a

6. If the mode of a data set is 17, what does this mean?

- a) 17 is the most frequently occurring value in the data set.

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- b) 17 is the middle value of the data set.
- c) 17 is the average of all the values in the data set.
- d) 17 is the smallest value in the data set.

Correct Answer: a)

7. In a class of 25 students, 10 students scored 90, 5 students scored 85, and the remaining students scored various other marks. What is the median score in the class?

- a) 85
- b) 90
- c) It cannot be determined with the given information.

Correct Answer: c

8. If the mean of a data set is 25 and the sum of the data values is 100, how many values are there in the data set?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: c)

9. A box contains 4 red balls, 3 green balls, and 2 blue balls. If you draw 3 balls with replacement, what is the probability of getting one ball of each color?

- a) $\frac{1}{18}$
- b) $\frac{1}{12}$
- c) $\frac{3}{40}$
- d) $\frac{1}{6}$

Correct Answer: d)

10. What is the probability of getting exactly two tails when flipping a fair coin three times?

- a) $\frac{1}{4}$
- b) $\frac{1}{2}$
- c) $\frac{3}{8}$
- d) $\frac{5}{8}$

Correct Answer: c)

11. In a standard deck of 52 cards, what is the probability of drawing a red card or a face card (king, queen, or jack)?

- a) $\frac{1}{4}$

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- b) $\frac{5}{13}$
- c) $\frac{7}{13}$
- d) $\frac{15}{26}$

Correct Answer: c)

12. If the probability of event A is 0.4 and the probability of event B is 0.3, and the events are independent, what is the probability of either event A or event B occurring?

- a) 0.1
- b) 0.2
- c) 0.7
- d) 0.8

Correct Answer: c

13. You have a box with 5 red balls, 4 green balls, and 3 blue balls. If you draw 2 balls without replacement, what is the probability of getting two balls of the same color?

- a) $\frac{11}{30}$
- b) $\frac{15}{33}$
- c) $\frac{2}{9}$
- d) $\frac{1}{6}$

Correct Answer: a)

14. In a deck of 52 cards, what is the probability of drawing a heart or a face card (king, queen, or jack)?

- a) $\frac{1}{4}$
- b) $\frac{13}{52}$
- c) $\frac{15}{52}$
- d) $\frac{9}{13}$

Correct Answer: d)

15. If you flip a fair coin three times, what is the probability of getting at least one head?

- a) $\frac{1}{8}$
- b) $\frac{7}{8}$
- c) $\frac{1}{4}$
- d) $\frac{3}{4}$

Correct Answer: b)

16. A spinner has 6 equal sections, numbered 1 through 6. What is the probability of spinning an even number or a number greater than 3?

- a) $\frac{1}{2}$

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b) $\frac{2}{3}$

c) $\frac{1}{3}$

d) $\frac{4}{6}$

Correct Answer: b)

17. In a class of 30 students, 12 students play soccer, 18 students play basketball, and 6 students play both soccer and basketball. What is the probability that a randomly selected student plays either soccer or basketball?

a) $\frac{1}{5}$

b) $\frac{1}{3}$

c) $\frac{2}{5}$

d) $\frac{4}{5}$

Correct Answer: d)

18. The length of a rectangular field is 4m longer than its breadth. If the perimeter of the field is 44m. Calculate the breadth.

a) 9m

b) 12 m

c) 9cm

d) 10 m

Correct Answer: a)

19. The co-efficient of xy in $3x-9xy+6yz$ is?

a) 3

b) 6

c) 9

d) -9

Correct Answer: d)

20. A person purchased a laptop on hire purchase for \$1,200. If the interest rate is 12% per annum and the time period is 2 years, what is the total amount paid at the end of 2 years?

a) \$1,320

b) \$1,440

c) \$1,464

d) \$1,560

Correct Answer: c)

21. If the principal amount is \$5,000, and the annual interest rate is 8%, how much compound interest will be earned after 3 years?

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- a) \$1,080
- b) \$1,240
- c) \$1,263.36
- d) \$1,380

Correct Answer: c)

22. If a shirt is sold at a 20% loss for \$40, what was its original selling price?

- a) \$48
- b) \$50
- c) \$52
- d) \$60

Correct Answer: b

23. A man bought a watch for \$900 and sold it at a loss of 10%. What is the selling price of the watch?

- a) \$800
- b) \$810
- c) \$820
- d) \$890

Correct Answer: b

24. If a bicycle is sold for \$360 after a discount of 20%, what was its original price?

- a) \$270
- b) \$400
- c) \$450
- d) \$500

Correct Answer: c)

25. A man sold a book for \$45, which was 20% more than its cost price. What was the cost price of the book?

- a) \$36
- b) \$40
- c) \$42
- d) \$45

Correct Answer: b)

26. A sum of money triples itself in 6 years at simple interest. What is the rate of interest per annum?

- a) 33.33%
- b) 16.67%
- c) 50%

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d) 20%

Correct Answer: a)

27. The cost price of a product is \$400, and it is sold at a profit of 25%. What is the selling price of the product?

a) \$450

b) \$500

c) \$525

d) \$600

Correct Answer: b

28. If the principal amount is \$3,000, the rate of interest is 5%, and the time period is 4 years, what is the compound interest earned?

a) \$628.50

b) \$650

c) \$662.14

d) \$700

Correct Answer: c)

29. A jacket is marked at \$180, and a discount of 25% is offered. If the discount is reduced by 10%, what will be the new selling price?

a) \$130.50

b) \$135

c) \$140

d) \$144

Correct Answer: a)

30. A person purchased a car on hire purchase for \$15,000. The interest is charged at 8% per annum. If the total amount paid over 3 years is \$18,000, what is the annual installment?

a) \$5,000

b) \$6,000

c) \$4,500

d) \$6,500

Correct Answer: b)

31. A pair of shoes is sold for \$96 after a discount of 20%. What was the original price of the shoes?

a) \$112

b) \$120

c) \$100

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d) \$110

Correct Answer: b)

32. If the selling price of an article is \$80 and the profit percentage is 25%, what is the cost price?

a) \$60

b) \$65

c) \$70

d) \$75

Correct Answer: a)

33. If the price of a smartphone is reduced by 15%, and the new price is \$306, what was the original price?

a) \$350

b) \$360

c) \$300

d) \$340

Correct Answer: b)

34. A sum of money becomes four times in 10 years at compound interest. What is the annual rate of interest?

a) 20%

b) 30%

c) 25%

d) 15%

Correct Answer: b)

35. A shirt is sold at a discount of 30% for \$28. What was its original selling price?

a) \$40

b) \$32

c) \$30

d) \$35

Correct Answer: a)

36. If the selling price of an item is \$900 and the loss percentage is 10%, what was the cost price?

a) \$990

b) \$990

c) \$1000

d) \$810

Correct Answer: b)

Class 8th Math Past Paper

37. A man sells a laptop for \$480, which is a 20% profit on the cost price. What is the cost price of the laptop?

- a) \$400
- b) \$450
- c) \$500
- d) \$550

Correct Answer: a)

38. A student scored 75% on a test. If he wants to increase his score to 80%, how much does he need to score on the next test?

- a) 2.5%
- b) 3%
- c) 5%
- d) 10%

Correct Answer: c)

39. A car is sold for \$18,000 after a 15% discount. If the car was originally marked at \$21,000, what is the amount of the discount?

- a) \$2,500
- b) \$2,700
- c) \$2,800
- d) \$3,000

Correct Answer: b)

40. Solve using algebraic formula $(103)^2$?

- a) 10609
- b) 10906
- c) 19600
- d) 10103

Correct Answer: a)

41. There are 75 packets of fruit in first carriage, 85 in 2nd carriage & 95 in 3rd carriage. Guess the number of packets in 7th carriage?

- a) 125
- b) 135
- c) 145
- d) 155

Correct Answer: b)

Class 8th Math Past Paper

42. The simplified form of $(a+b)-(a-b)$ is ?

- a) $4ab$
- b) $2a+2b$
- c) $2b$
- d) $2a$

Correct Answer: c)

43. If $(6,c)=(-d,-1)$, then the value of d is?

- a) -1
- b) 6
- c) 1
- d) -6

Correct Answer: b

44. Images produced under rigid transformation are?

- a) Similar
- b) Congruent
- c) Different
- d) Same

Correct Answer: b)

45. Can you guess the arc length of a circle with central angle of 60 degree & radius 6 m.

- a) 6.18m
- b) 6.28m
- c) 6.38m
- d) 6.48m

Correct Answer: b)

46. Angle in semicircle is always

- a) 100 degree
- b) 150 degree
- c) 180 degree
- d) 90 degree

Correct Answer: d)

47. In a quadrilateral EFGH, $EF=FG=GH=HE$ & E is not equal to 90 degree, and then EFGH is?

- a) Square

Class 8th Math Past Paper

b)Rectangle

c)Parallelogram

d)Rhombus

Correct Answer: d)

48. Guess the volume of a semi spherical bowl in litres whose diameter is 4.2m.

a)19402 litres

b)19404 litres

c)19406 litres

d)19408 litres

Correct Answer: b)

49. What type of graph is most suitable to represent data on production of wheat during last five years?

a)Bar graph

b)Line graph

c) Pie graph

d)Multiple bar graph

Correct Answer: b

50. Simplify the expression: $3x - 2(2x - 5)$.

a) $x + 10$

b) $x - 10$

c) $x + 1$

d) $x - 1$

Correct Answer: a)

Class 9th Math Past Paper

9th Maths

1. If the selling price of an article is \$80 and the profit percentage is 25%, what is the cost price?

- a) \$60
- b) \$65
- c) \$70
- d) \$75

Correct Answer: a)

2. If the price of a smartphone is reduced by 15%, and the new price is \$306, what was the original price?

- a) \$350
- b) \$360
- c) \$300
- d) \$340

Correct Answer: a)

3. A sum of money becomes four times in 10 years at compound interest. What is the annual rate of interest?

- a) 20%
- b) 30%
- c) 25%
- d) 15%

Correct Answer: b)

4. A shirt is sold at a discount of 30% for \$28. What was its original selling price?

- a) \$40
- b) \$32
- c) \$30
- d) \$35

Correct Answer: a)

5. If the selling price of an item is \$900 and the loss percentage is 10%, what was the cost price?

- a) \$990
- b) \$990
- c) \$1000
- d) \$810

Correct Answer: b)

6. A man sells a laptop for \$480, which is a 20% profit on the cost price. What is the cost price of the laptop?

- a) \$400
- b) \$450
- c) \$500
- d) \$550

Class 9th Math Past Paper

Correct Answer: a)

7. A student scored 75% on a test. If he wants to increase his score to 80%, how much does he need to score on the next test?

- a) 2.5%
- b) 3%
- c) 5%
- d) 10%

Correct Answer: c)

8. A car is sold for \$18,000 after a 15% discount. If the car was originally marked at \$21,000, what is the amount of the discount?

- a) \$2,500
- b) \$2,700
- c) \$2,800
- d) \$3,000

Correct Answer: b)

9. Solve using algebraic formula $(103)^2$?

- a) 10609
- b) 10906
- c) 19600
- d) 10103

Correct Answer: a)

10. There are 75 packets of fruit in first carriage, 85 in 2nd carriage & 95 in 3rd carriage. Guess the number of packets in 7th carriage?

- a) 125
- b) 135
- c) 145
- d) 155

Correct Answer: b)

11. The simplified form of $(a+b)-(a-b)$ is ?

- a) $4ab$
- b) $2a+2b$
- c) $2b$
- d) $2a$

Correct Answer: c)

12. If $(6,c)=(-d,-1)$, then the value of d is?

- a) -1
- b) 6
- c) 1
- d) -6

Correct Answer: d)

Class 9th Math Past Paper

13. Images produced under rigid transformation are?

- a) Similar
- b) Congruent
- c) Different
- d) Same

Correct Answer: b)

14. The order of matrix $\begin{bmatrix} 2 & 1 \end{bmatrix}$ is ...

- a) 2-by-1
- b) 1-by-2
- c) 1-by-1
- d) 2-by-2

Correct Answer: b)

15. The union of the set of rational numbers and irrational numbers is known as set of ____

- a) Rational number
- b) Irrational
- c) Real number
- d) Whole number

Correct Answer: c)

16. The factor of $x^2 - 5x + 6$ are: ____

- a) $x + 1, x - 6$
- b) $x - 2, x - 3$
- c) $x + 6, x - 1$
- d) $x + 2, x + 3$

Correct Answer: b)

17. $2(5+4i) - 3(7+4i) =$

- a) $-5-4i$
- b) $-11-4i$
- c) $-13-5i$
- d) $11-4i$

Correct Answer: b)

18. A non-terminating, non-recurring decimal represents?

- a) Natural number
- b) Rational number
- c) Irrational number
- d) Prime number

Correct Answer: c)

19. The value of L in $\log_3 81 = L$ is?

- a) 2
- b) 3

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c)4

d)5

Correct Answer: c)

20. The value of x in $\log_x 64 = 2$ is?

a)2

b)4

c)6

d)8

Correct Answer: d)

21. If $\log 2 = 0.3010$, $\log 3 = 0.4771$, $\log 5 = 0.6990$, then value of $\log 24$ is?

a)1.5050

b)1.3801

c)0.2615

d)0.4259

Correct Answer: b)

22. The logarithm of unity to any base is?

a)1

b)10

c)E

d)0

Correct Answer: b)

23. If $a+b+c=7$ and $ab+bc+ca=9$ then, $a^2+b^2+c^2=?$

a)28

b)30

c)31

d)33

Correct Answer: c)

24. If $2x-3y=10$ and $xy=2$, then $8x^3-27y^3=?$

a) 1420

b)1360

c)1540

d)1340

Correct Answer: b)

25. If $x+1/x=8$ then $x^3+1/x^3=?$

a) 466

b) 488

c) 455

d) 460

Correct Answer: b)

Class 9th Math Past Paper

26. H.C.F of $x^3 y - yx^3$ & $x^5 y^2 - y^2 x^5$ is?

- a) $xy(x-y)$
- b) $x(xy-y)$
- c) $y(xy-y)$
- d) $xy-y$

Correct Answer: a)

27. The value of i^{88} ?

- a) 1
- b) -1
- c) 0
- d) None of these

Correct Answer: a)

28. A surd which contains two terms is called?

- a) Monomial surd
- b) Binomial surd
- c) Polynomial surd
- d) None of these

Correct Answer: b)

29. In $-2 < x < 3/2$, $x = ?$

- a) -5
- b) 3
- c) 2
- d) 0

Correct Answer: d)

30. Solve for x in the equation: $2(3x - 5) = 4x + 6$.

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b)

31. If a circle has a radius of 7 cm, what is its approximate circumference?

- a) 14 cm
- b) 22 cm
- c) 44 cm
- d) $44/7$ cm

Correct Answer: b)

32. What is the area of a triangle with a base of 10 cm and a height of 8 cm?

- a) 40 square cm
- b) 80 square cm

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c) 80 square cm

d) 20 square cm

Correct Answer: a)

33. If $3x + 4 = 16$, what is the value of x ?

a) 4

b) 5

c) 6

d) 7

Correct Answer: c)

34. The relation $\{(1,2), (2,3), (3,3), (3,4)\}$ is

a) Onto function

b) Into function

c) Not a function

d) One-

one

functio

n

Correct Answer: c)

35. If E and F are the midpoints of equal sides AB and AC of a triangle ABC. Then:

a) $BF=AC$

b) $BF=AF$

c) $CE=AB$

d) $BF=CE$

Correct Answer: d)

36. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB, respectively. Then:

a) $BE > CF$

b) $BE < CF$

c) $BE = CF$

d) Non

e

Correct Answer: c)

37. The 11 term of the sequences $1+i$, 2 , $2(1-i)$, $\dots$

a) $32(1+i)$

b) $32(1-i)$

c) $16(1-i)$

d) $16(1+i)$

Correct Answer: c)

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38. In a deck of playing cards, what is the probability of drawing a red card (hearts or diamonds)?

- a) $\frac{1}{4}$
- b) $\frac{1}{2}$
- c) $\frac{3}{4}$
- d) $\frac{1}{3}$

Correct Answer: c)

39. A box contains 4 red balls, 3 green balls, and 2 blue balls. If you draw 3 balls with replacement, what is the probability of getting one ball of each color?

- a) $\frac{1}{18}$
- b) $\frac{1}{12}$
- c) $\frac{3}{40}$
- d) $\frac{1}{6}$

Correct Answer: d)

40. What is the probability of getting exactly two tails when flipping a fair coin three times?

- a) $\frac{1}{4}$
- b) $\frac{1}{2}$
- c) $\frac{3}{8}$
- d) $\frac{5}{8}$

Correct Answer: c)

41. In a standard deck of 52 cards, what is the probability of drawing a red card or a face card (king, queen, or jack)?

- a) $\frac{1}{4}$
- b) $\frac{5}{13}$
- c) $\frac{7}{13}$
- d) $\frac{15}{26}$

Correct Answer: c)

42. If the probability of event A is 0.4 and the probability of event B is 0.3, and the events are independent, what is the probability of either event A or event B occurring?

- a) 0.1
- b) 0.2
- c) 0.7
- d) 0.8

Correct Answer: d)

43. You have a box with 5 red balls, 4 green balls, and 3 blue balls. If you draw 2 balls without replacement, what is the probability of getting two balls of the same color?

- a) $\frac{11}{30}$
- b) $\frac{15}{33}$
- c) $\frac{2}{9}$
- d) $\frac{1}{6}$

Correct Answer: a)

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44. In a deck of 52 cards, what is the probability of drawing a heart or a face card (king, queen, or jack)?

- a) $\frac{1}{4}$
- b) $\frac{13}{52}$
- c) $\frac{15}{52}$
- d) $\frac{9}{13}$

Correct Answer: d)

45. If you flip a fair coin three times, what is the probability of getting at least one head?

- a) $\frac{1}{8}$
- b) $\frac{7}{8}$
- c) $\frac{1}{4}$
- d) $\frac{3}{4}$

Correct Answer: b)

46. A spinner has 6 equal sections, numbered 1 through 6. What is the probability of spinning an even number or a number greater than 3?

- a) $\frac{1}{2}$
- b) $\frac{2}{3}$
- c) $\frac{1}{3}$
- d) $\frac{4}{6}$

Correct Answer: b)

47. In a class of 30 students, 12 students play soccer, 18 students play basketball, and 6 students play both soccer and basketball. What is the probability that a randomly selected student plays either soccer or basketball?

- a) $\frac{1}{5}$
- b) $\frac{1}{3}$
- c) $\frac{2}{5}$
- d) $\frac{4}{5}$

Correct Answer: d)

48. The length of a rectangular field is 4m longer than its breadth. If the perimeter of the field is 44m. Calculate the breadth.

- a) 9m
- b) 12 m
- c) 9cm
- d) 10 m

Correct Answer: a)

49. The co-efficient of xy in $3x-9xy+6yz$ is?

- a) 3
- b) 6
- c) 9

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Correct Answer: d)

50. A person purchased a laptop on hire purchase for \$1,200. If the interest rate is 12% per annum and the time period is 2 years, what is the total amount paid at the end of 2 years?

- a) \$1,320
- b) \$1,440
- c) \$1,464
- d) \$1,560

Correct Answer: c)

51. What is the median of the following set of numbers: 7, 5, 9, 2, 8?

- a) 5
- b) 7
- c) 8
- d) 9

Correct Answer: b)

52. Find the mode of the following data set: 3, 5, 2, 5, 6, 7, 5, 2, 8, 4.

- a) 5
- b) 2
- c) 8
- d) 6

Correct Answer: a)

53. Calculate the mean of the numbers 12, 8, 5, 15, and 10.

- a) 12
- b) 10
- c) 8
- d) 11

Correct Answer: d)

54. In a school competition, the scores of 10 students out of 100 are as follows: 85, 92, 88, 95, 72, 88, 78, 92, 88, 90. What is the mode of the scores?

- a) 72
- b) 78
- c) 88
- d) 92

Correct Answer: c)

Class 9th Math Past Paper

55. If a triangle has sides of lengths 5, 12, and 13, is it a right triangle?

- a) Yes
- b) No

Correct Answer: a)

56. In a circle, if two chords are equal, then their corresponding arcs are:

- a) Equal
- b) Not necessarily equal
- c) Supplementary
- d) Complementary

Correct Answer: b)

57. What is the relationship between the diameter and the radius of a circle?

- a) Diameter = 2 x Radius
- b) Diameter = Radius
- c) Diameter = $\frac{1}{2}$ x Radius
- d) Diameter = Radius²

Correct Answer: a)

58. A line that touches a circle at only one point is called a:

- a) Chord
- b) Radius
- c) Tangent
- d) Secant

Correct Answer: c)

59. What is the ratio of the circumference of a circle to its diameter, approximately?

- a) π
- b) 2
- c) 3.14
- d) 1

Correct Answer: a)

60. The measure of the central angle of a circle that subtends an arc equal to the radius is:

- a) 45 degrees
- b) 60 degrees
- c) 90 degrees
- d) 180 degrees

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Correct Answer: b)

61. What is the Pythagorean theorem used to calculate in a right triangle?

- a) Perimeter
- b) Area
- c) Angles
- d) Lengths of sides

Correct Answer: d)

62. In a right triangle, which side is the hypotenuse?

- a) The side opposite the right angle
- b) The longer side
- c) The shorter side
- d) The adjacent side

Correct Answer: b)

63. If a triangle has sides of lengths 7, 24, and 25, is it a right triangle?

- a) Yes
- b) No

Correct Answer: a)

64. A water tank can be emptied in 50 minutes by 5 pumps. How long will it take if 1 pump is out of order?

- a) 62 min
- b) 62.5 min
- c) 63 min
- d) 63.5 min

Correct Answer: b)

65. A composite number has?

- a) 1 factor
- b) 2 factors
- c) More than 2 factors
- d) None of these

Correct Answer: C)

66. The monthly rent of a stall is decreased in the ratio 5:6. As a result, the stall holder saves Rs. 4000 a month. Guess the original rent?

- a) 12000

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b) 14000

c) 22000

d) 24000

Correct Answer: d)

67. A picture measuring 8.5 cm by 5.5cm is enlarged in the ratio 7:5. Guess the dimensions of the new picture?

a) 11.9cm, 7.7cm

b) 12cm, 8cm

c) 9cm, 6cm

d) 10cm, 9cm

Correct Answer: a)

68. A recipe requires 2 cups of flour to make 12 butter milk biscuits. How much flour is needed to make 30 biscuits?

a) 2 cups

b) 3 cups

c) 4 cups

d) 5 cups

Correct Answer: d)

69. What is the result of dividing $(6x^3 - 12x^2 + 18x)$ by $6x$?

a) $x^2 - 2x + 3$

b) $x^2 - 2x$

c) $x^2 - 12x + 3$

d) $x^2 - 12x$

Correct Answer: a)

70. When you divide $(5a^3b^2 - 10a^2b^3)$ by $5ab^2$, what is the simplified expression?

a) $a^2 - 2b$

b) $a^2 - 2ab$

c) $a - 2b$

d) $a^2 - 2b^2$

Correct Answer: a)

Class 10th Math Past Paper

10th Maths

1. The order of matrix $\begin{bmatrix} 2 & 1 \end{bmatrix}$ is ...

- a) 2-by-1
- b) 1-by-2
- c) 1-by-1
- d) 2-by-2

Correct Answer: b)

2. The union of the set of rational numbers and irrational numbers is known as set of ____

- a) Rational number
- b) Irrational
- c) Real number
- d) Whole number

Correct Answer: c)

3. The factor of $x^2 - 5x + 6$ are: ____

- a) $x + 1, x - 6$
- b) $x - 2, x - 3$
- c) $x + 6, x - 1$
- d) $x + 2, x + 3$

Correct Answer: b)

4. $2(5+4i) - 3(7+4i) =$

- a) $-5-4i$
- b) $-11-4i$
- c) $-13-5i$
- d) $11-4i$

Correct Answer: b)

5. A non-terminating, non-recurring decimal represents?

- a) Natural number
- b) Rational number
- c) Irrational number
- d) Prime number

Correct Answer: c)

6. The value of L in $\log_3 81 = L$ is?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: c)

7. The value of x in $\log_x 64 = 2$ is?

- a) 2
- b) 4
- c) 6
- d) 8

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Correct Answer: d)

8. If $\log 2=0.3010$, $\log 3=0.4771$, $\log 5=0.6990$, then value of $\log 24$ is?
- a)1.5050
 - b)1.3801
 - c)0.2615
 - d)0.4259

Correct Answer: b)

9. The logarithm of unity to any base is?
- a)1
 - b)10
 - c)E
 - d)0

Correct Answer: b)

10. If $a+b+c=7$ and $ab+bc+ca=9$ then, $a^2+b^2+c^2=?$
- a)28
 - b)30
 - c)31
 - d)33

Correct Answer: c)

11. If $2x-3y=10$ and $xy=2$, then $8x^3-27y^3=?$
- a) 1420
 - b)1360
 - c)1540
 - d)1340

Correct Answer: b)

12. If $x+1/x=8$ then $x^3+1/x^3=?$
- a) 466
 - b) 488
 - c) 455
 - d) 460

Correct Answer: b)

13. H.C.F of $x^3 y-yx^3$ & $x^5 y^2 - y^2 x^5$ is?
- a) $xy(x-y)$
 - b) $X(xy-y)$
 - c) $Y(xy-y)$
 - d) $Xy-y$

Correct Answer: a)

14. The value of i^{88} ?
- a)1
 - b)-1
 - c)0
 - d)None of these

Class 10th Math Past Paper

Correct Answer: a)

15. A surd which contains a single term is called?

- a) Monomial surd
- b) Binomial surd
- c) Polynomial surd
- d) None of these

Correct Answer: a)

16. In $-2 < x < 3/2$, $x = ?$

- a) -5
- b) 3
- c) 2
- d) 0

Correct Answer: d)

17. Solve for x in the equation: $2(3x - 5) = 4x + 6$.

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: b)

18. If a circle has a radius of 7 cm, what is its approximate circumference?

- a) 14 cm
- b) 22 cm
- c) 44 cm
- d) $44/7$ cm

Correct Answer: b)

19. What is the area of a triangle with a base of 10 cm and a height of 8 cm?

- a) 40 square cm
- b) 60 square cm
- c) 80 square cm
- d) 20 square cm

Correct Answer: a)

20. If $3x + 4 = 16$, what is the value of x?

- a) 4
- b) 5
- c) 6
- d) 7

Correct Answer: c)

21. What is the result of multiplying a 2×3 matrix by a 3×4 matrix?

- a) A 2×4 matrix
- b) A 2×3 matrix
- c) A 3×3 matrix

Class 10th Math Past Paper

d) A 3x4 matrix

Correct Answer: a)

22. What is the determinant of a 2x2 matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$?

a) $ad - bc$

b) $ab + cd$

c) $ac + bd$

d) $(a + d)(b + c)$

Correct Answer: a)

23. In three-dimensional space, a vector has components (2, -3, 1). What is the magnitude of this vector?

a) $\sqrt{14}$

b) $\sqrt{6}$

c) $\sqrt{18}$

d) 6

Correct Answer: b)

24. The dot product of two vectors is 0. What can you conclude about the angle between them?

a) The angle is 90 degrees (perpendicular).

b) The angle is 45 degrees.

c) The angle is 180 degrees (opposite).

d) The angle is 0 degrees (collinear).

Correct Answer: a)

25. In set notation, what does the intersection of sets A and B represent?

a) All elements that are in either set A or set B.

b) All elements that are in both set A and set B.

c) All elements that are only in set A.

d) All elements that are only in set B.

Correct Answer: b)

26. If set $X = \{1, 2, 3\}$ and set $Y = \{3, 4, 5\}$, what is the union of sets X and Y?

a) $\{1, 2, 3, 4, 5\}$

b) $\{1, 2, 3\}$

c) $\{3\}$

d) $\{4, 5\}$

Correct Answer: a)

27. What is the complement of a set A with respect to a universal set U?

a) The set of all elements in A.

b) The set of all elements in U but not in A.

c) The set of all elements in A but not in U.

d) The set of all prime numbers.

Correct Answer: b)

28. What is the standard rate of GST in many countries?

a) 5%

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- b) 10%
- c) 15%
- d) 20%

Correct Answer: b)

29. In a GST-inclusive price of \$110, if the GST rate is 10%, what is the original price before GST?

- a) \$100
- b) \$120
- c) \$90
- d) \$10

Correct Answer: a)

30. A salesperson earns a 5% commission on each sale. If they make a sale of \$500, how much commission do they earn?

- a) \$5
- b) \$10
- c) \$25
- d) \$50

Correct Answer: c)

31. If a real estate agent receives a 3% commission on the sale of a house for \$300,000, how much is their commission?

- a) \$3,000
- b) \$9,000
- c) \$30,000
- d) \$900

Correct Answer: a)

32. What is the probability of rolling a 6 on a fair six-sided die?

- a) $\frac{1}{6}$
- b) $\frac{1}{2}$
- c) $\frac{1}{3}$
- d) 1

Correct Answer: a)

33. If you flip a coin, what is the probability of getting heads or tails?

- a) $\frac{1}{6}$
- b) $\frac{1}{2}$
- c) $\frac{2}{3}$
- d) 1

Correct Answer: a)

34. In a right-angled triangle, the side opposite the right angle is called:

- a) Hypotenuse
- b) Adjacent
- c) Opposite

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d) Base

Correct Answer: a)

35. In a right-angled triangle, the tangent of an angle is equal to:

a) Opposite / Adjacent

b) Hypotenuse / Base

c) Base / Hypotenuse

d) Adjacent / Opposite

Correct Answer: a)

36. In a right-angled triangle, if one side is 4 and the other is 3, what is the length of the hypotenuse?

a) 7

b) 5

c) 12

d) 9

Correct Answer: b)

37. Which of the following is the Pythagorean theorem?

a) $c^2 = a^2 + b^2$

b) $a^2 = b^2 - c^2$

c) $a^2 = b^2 * c^2$

d) $a^2 = b + c$

Correct Answer: a)

38. What is the perimeter of a square with sides of length 8 cm?

a) 32 cm

b) 64 cm

c) 16 cm

d) 24 cm

Correct Answer: a)

39. The formula to find the surface area of a cube is:

a) $6 * \text{side length}$

b) $4 * \text{side length}$

c) $2 * \text{side length}$

d) side length^2

Correct Answer: a)

40. What is the next number in the sequence: 2, 5, 10, 17, ...?

a) 22

b) 24

c) 26

d) 28

Correct Answer: c)

1. Symbol for congruent is:

a) $\leftrightarrow$

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b) N

c) =

d) $\cong$

Correct Answer: d)

42. Median bisecting the base angle of an isosceles triangle bisects the _____ angle.

a) base

b) vertical

c) right

d) acute

Correct Answer: b)

43. In a parallelogram opposite sides are...

a) different

b) perpendicular

c) congruent

d) intersecting

Correct Answer: C)

44. In a parallelogram opposite angles are

a) parallel

b) congruent

c) complementary

d) adjacent

Correct Answer: b)

45. The length of a rectangular field is 4m longer than its breadth. If the perimeter of the field is 44m. Calculate the breadth.

a) 9m

b) 12 m

c) 9cm

d) 10 m

Correct Answer: a)

46. The co-efficient of xy in $3x-9xy+6yz$ is?

a) 3

b) 6

c) 9

d) -9

Correct Answer: d)

47. A person purchased a laptop on hire purchase for \$1,200. If the interest rate is 12% per annum and the time period is 2 years, what is the total amount paid at the end of 2 years?

a) \$1,320

b) \$1,440

c) \$1,464

d) \$1,560

Correct Answer: c)

Class 10th Math Past Paper

48. If the principal amount is \$5,000, and the annual interest rate is 8%, how much compound interest will be earned after 3 years?

- a) \$1,080
- b) \$1,240
- c) \$1,263.36
- d) \$1,380

Correct Answer: c)

49. If a shirt is sold at a 20% loss for \$40, what was its original selling price?

- a) \$48
- b) \$50
- c) \$52
- d) \$60

Correct Answer: d)

50. A man bought a watch for \$900 and sold it at a loss of 10%. What is the selling price of the watch?

- a) \$800
- b) \$810
- c) \$820
- d) \$890

Correct Answer: c)

51. If a bicycle is sold for \$360 after a discount of 20%, what was its original price?

- a) \$270
- b) \$400
- c) \$450
- d) \$500

Correct Answer: c)

52. A man sold a book for \$45, which was 20% more than its cost price. What was the cost price of the book?

- a) \$36
- b) \$40
- c) \$42
- d) \$45

Correct Answer: b)

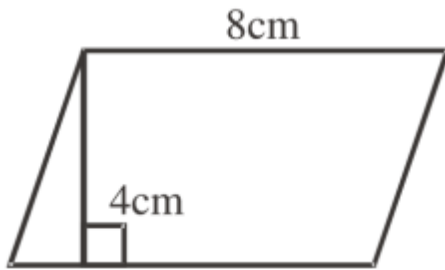
53. The common point of three or more than three lines is called.....

- (a) central point
- (b) point of concurrency
- (c) vertex
- (d) centroid

Correct Answer: b)

54. Area of a given figure is??

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- a) 32 cm
- b) 32 sq cm
- c) 33 sq cm
- d) 55 cm

Correct Answer: b)

55. Area of trapezium is..?

- a) $\frac{1}{2} \times (\text{Sum of bases}) \times \text{height}$
- b) $\frac{3}{2} \times (\text{Sum of bases}) \times \text{height}$
- c) $\frac{1}{2} \times (\text{sum of non-parallel sides}) \times \text{sum of bases}$
- d) all of them

Correct Answer: a)

56. $|-4| + | -(-5) |$ is?

- a) 9
- b) -9
- c) 8
- d) -8

Correct Answer: a)

57. Can you guess the arc length of a circle with central angle of 60 degree & radius 6 m.

- a) 6.18m
- b) 6.28m
- c) 6.38m
- d) 6.48m

Correct Answer: b)

58. Angle in semicircle is always

- a) 100 degree
- b) 150 degree
- c) 180 degree
- d) 90 degree

Correct Answer: d)

59. In a quadrilateral EFGH, $EF=FG=GH=HE$ & E is not equal to 90 degree, and then EFGH is?

- a) Square
- b) Rectangle
- c) Parallelogram
- d) Rhombus

Correct Answer: d)

60. Guess the volume of a semi spherical bowl in litres whose diameter is 4.2m.

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- a) 19402 litres
- b) 19404 litres
- c) 19406 litres
- d) 19408 litres

Correct Answer: b)

61. What type of graph is most suitable to represent data on production of wheat during last five years?

- a) Bar graph
- b) Line graph
- c) Pie graph
- d) Multiple bar graph

Correct Answer: d)

62. Simplify the expression: $3x - 2(2x - 5)$.

- a) $x + 10$
- b) $x - 10$
- c) $x + 1$
- d) $x - 1$

Correct Answer: a)

63. What is the value of x in the equation $2x + 7 = 15$?

- a) 4
- b) 5
- c) 6
- d) 8

Correct Answer: b)

64. If $3(x - 4) = 15$, what is the value of x ?

- a) 9
- b) 8
- c) 7
- d) 6

Correct Answer: a)

65. A sum of money triples itself in 6 years at simple interest. What is the rate of interest per annum?

- a) 33.33%
- b) 16.67%
- c) 50%
- d) 20%

Correct Answer: a)

66. The cost price of a product is \$400, and it is sold at a profit of 25%. What is the selling price of the product?

- a) \$450
- b) \$500
- c) \$525
- d) \$600

Correct Answer: c)

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67. If the principal amount is \$3,000, the rate of interest is 5%, and the time period is 4 years, what is the compound interest earned?

- a) \$628.50
- b) \$650
- c) \$662.14
- d) \$700

Correct Answer: c)

68. A jacket is marked at \$180, and a discount of 25% is offered. If the discount is reduced by 10%, what will be the new selling price?

- a) \$130.50
- b) \$135
- c) \$140
- d) \$144

Correct Answer: a)

69. A person purchased a car on hire purchase for \$15,000. The interest is charged at 8% per annum. If the total amount paid over 3 years is \$18,000, what is the annual installment?

- a) \$5,000
- b) \$6,000
- c) \$4,500
- d) \$6,500

Correct Answer: b)

70. A pair of shoes is sold for \$96 after a discount of 20%. What was the original price of the shoes?

- a) \$112
- b) \$120
- c) \$100
- d) \$110

Correct Answer: b)

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1. If X & Y are two sets & $n(X) = 18$, $n(Y) = 24$, $n(X \cup Y) = 40$ then $n(X \cap Y) =$

- a) 3
- b) 4
- c) 6
- d) 2
- e) 1

Correct Answer: d

2. If $x < y$, $y < z$ then

- a) $x > z$
- b) $x < z$
- c) $x = z$
- d) none of these

Correct Answer: b)

3. What is the expansion of $(x + y)^3$ using the Binomial Theorem?

- a) $x^3 + 3xy + 3y^2 + y^3$
- b) $x^3 + 3x^2y + 3xy^2 + y^3$
- c) $x^3 + 6xy + 12y^2 + y^3$
- d) $x^3 + 9xy + 27y^3$

Correct Answer: b)

4. In the Binomial Theorem, what does "n" represent?

- a) The coefficient of the first term
- b) The number of terms in the expansion
- c) The exponent of the binomial expression
- d) The value of the constant term

Correct Answer: c)

5. If you roll a fair six-sided die, what is the probability of getting an even number?

- a) $\frac{1}{2}$
- b) $\frac{1}{3}$
- c) $\frac{2}{3}$
- d) $\frac{1}{6}$

Correct Answer: c)

6. A deck of playing cards contains 52 cards. What is the probability of drawing a red card (hearts or diamonds) from a well-shuffled deck?

- a) $\frac{1}{2}$
- b) $\frac{1}{4}$
- c) $\frac{1}{3}$
- d) $\frac{1}{13}$

Correct Answer: b)

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7. How many ways can you arrange the letters of the word "APPLE"?
- a) 12
 - b) 24
 - c) 60
 - d) 120

Correct Answer: b)

8. In how many ways can you choose a committee of 2 people from a group of 5 without considering the order of selection?
- a) 5
 - b) 10
 - c) 15
 - d) 20

Correct Answer: b)

9. What is the value of $\sin(60 \text{ degrees})$?
- a) $1/2$
 - b) $\sqrt{3}/2$
 - c) 1
 - d) $2/\sqrt{3}$

Correct Answer: b)

10. If $\cos(\theta) = 1/2$, what is the value of θ in degrees?
- a) 30 degrees
 - b) 45 degrees
 - c) 60 degrees
 - d) 90 degrees

Correct Answer: a)

11. In a right triangle, the tangent of an acute angle is the ratio of:
- a) The adjacent side to the hypotenuse
 - b) The opposite side to the adjacent side
 - c) The hypotenuse to the opposite side
 - d) The sum of the two acute angles

Correct Answer: b)

12. If $\sin(\alpha) = 3/5$ and $\cos(\beta) = 4/5$, what is the value of $\sin(\alpha + \beta)$?
- a) $12/25$
 - b) $4/5$
 - c) $3/5$
 - d) $7/5$

Correct Answer: a)

13. What is the value of $\tan(45 \text{ degrees})$?
- a) 0

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- b) 1
- c) $\sqrt{2}/2$
- d) $\sqrt{3}/2$

Correct Answer: b)

14. If $\sec(\theta) = 2$, what is the value of $\cos(\theta)$?

- a) $1/2$
- b) 2
- c) $1/\sqrt{2}$
- d) $2\sqrt{2}$

Correct Answer: a)

15. In a deck of 52 cards, what is the probability of drawing a card that is neither a spade nor a club?

- a) $1/4$
- b) $1/2$
- c) $3/4$
- d) $1/3$

Correct Answer: c)

16. If the probability of event A occurring is 0.4, and the probability of event B occurring is 0.3, what is the probability of both events A and B occurring if they are independent?

- a) 0.12
- b) 0.7
- c) 0.15
- d) 0.2

Correct Answer: a)

17. Two dice are rolled. What is the probability that the sum of the two dice is 7?

- a) $1/6$
- b) $1/12$
- c) $1/9$
- d) $1/36$

Correct Answer: c)

18. In a group of 10 people, how many ways can you select a committee of 3 with a specific person as the chair?

- a) 90
- b) 30
- c) 27
- d) 210

Correct Answer: b)

19. You have a bag with 5 red balls, 4 green balls, and 3 blue balls. What is the probability of drawing a green ball followed by a red ball without replacement?

- a) $4/36$
- b) $4/44$

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- c) $\frac{4}{48}$
- d) $\frac{4}{52}$

Correct Answer: b)

20. If the odds of winning a game are 3:2, what is the probability of winning the game?
- a) $\frac{1}{3}$
 - b) $\frac{2}{5}$
 - c) $\frac{3}{5}$
 - d) $\frac{2}{3}$

Correct Answer: c)

21. A box contains 5 red balls, 4 green balls, and 3 blue balls. If you draw 2 balls without replacement, what is the probability that both balls are red?
- a) $\frac{5}{66}$
 - b) $\frac{10}{44}$
 - c) $\frac{5}{11}$
 - d) $\frac{10}{33}$

Correct Answer: c)

22. In a standard deck of 52 cards, what is the probability of drawing a heart or a face card (jack, queen, king)?
- a) $\frac{3}{13}$
 - b) $\frac{1}{4}$
 - c) $\frac{7}{13}$
 - d) $\frac{1}{2}$

Correct Answer: c)

23. If the probability of event A is 0.6 and the probability of event B is 0.7, what is the probability of either event A or event B occurring?
- a) 0.42
 - b) 0.18
 - c) 0.3
 - d) 0.84

Correct Answer: d)

24. In a bag, there are 6 red marbles, 4 blue marbles, and 5 green marbles. What is the probability of drawing a red marble or a blue marble?
- a) $\frac{5}{15}$
 - b) $\frac{1}{2}$
 - c) $\frac{10}{15}$
 - d) $\frac{2}{3}$

Correct Answer: c)

25. In a geometric sequence, the first term is 5, and the common ratio is 3. What is the 10th term of this sequence?
- a) 5,242,880
 - b) 2,430

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- c) 15,625
- d) 78,125

Correct Answer: a)

26. The sum of an infinite geometric series is 20, and the first term is 6. If the common ratio is between -1 and 1, what is the value of the common ratio?

- a) 0.1
- b) 0.2
- c) -0.1
- d) -0.2

Correct Answer: a)

27. In a geometric sequence, the second term is 16, and the fourth term is 64. What is the sum of the first 5 terms of this sequence?

- a) 325
- b) 341
- c) 437
- d) 465

Correct Answer: c)

28. In a geometric sequence, the sum of the first 4 terms is 30, and the sum of the first 8 terms is 120. What is the common ratio of this sequence?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: a)

29. The 7th term of a geometric sequence is 512, and the sum of the first 7 terms is 683. What is the common ratio of this sequence?

- a) 2
- b) 3
- c) 4
- d) 5

Correct Answer: c)

30. Arc length closed by a circle of radius 10 cm by 60 degree.

- a) $\frac{\pi}{5}$
- b) $\frac{2\pi}{5}$
- c) $\frac{\pi^3}{10}$
- d) $\frac{10\pi}{3}$

Correct Answer: d)

31. A hotel menu lists 3 soups, 10 meat dishes, 3 beverages, 5 deserts. In how many ways can a meal be ordered?

- a) 450

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- b) 560
- c) 980
- d) None

Correct Answer: a)

32. An automobile manufacturer offers 6 different models with the choice of 10 different exterior colors and 7 different interior colors. How many different cars does it offer?

- a) 320
- b) 420
- c) 450
- d) 600

Correct Answer: b)

33. If $a \cdot b = a + b - 2$, then inverse of 1 is

- a) 1
- b) 2
- c) 3
- d) 4

Correct Answer: a)

34. Sum of two numbers is 32 and the sum of their squares is 904. Find the greatest number ?

- a) 50
- b) 40
- c) 35
- d) 30

Correct Answer: d)

35. A _____ is the measure of the central angle of an arc of a circle whose length is equal to the radius of the circle.

- a) Radian
- b) Degree
- c) Celsius
- d) None

Correct Answer: a)

36. The process by which an observation is made is known as:

- a) Trial
- b) Outcome
- c) Space
- d) Event

Correct Answer: a)

37. The result of an experiment is called as:

- a) Trial
- b) Outcome
- c) Space
- d) Event

Correct Answer: b)

38. Every possible outcome, no two of which may be out come at the same times, is called as:

- a) Trial
- b) Outcome
- c) Sample Space
- d) Event

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Correct Answer: c)

39. The sum of cube roots of unity is equal to

- a) -1
- b) 1
- c) 0
- d) None

Correct Answer: c)

40. The complex cube roots of unity are called as:

- a) Cube of each other
- b) Square root of each other
- c) Square of each other
- d) None

Correct Answer: c)

41. Minimum positive integral value of K for which the equation $2x^2 + 6x + K = 0$, has complex roots is?

- a) 4
- b) 5
- c) 3
- d) 0

Correct Answer: b)

42. Cubic roots of unity are _____ whereas the fourth roots are _____.

- a) $1, \omega, \omega^2; 1, -1$
- b) $1, \omega, \omega^2; 1, -1, i, -i$
- c) $1, \omega, \omega^3; 1, -1, i, -i$
- d) $1, \omega, \omega^2; 1, -1, i, -i$

Correct Answer: d)

43. Which of the following numbers is a real number?

- a) $\sqrt{-1}$
- b) 0
- c) i
- d) $1/0$

Correct Answer: b)

44. What is the square root of -9?

- a) $\sqrt{-3}$
- b) $3i$
- c) $-3i$
- d) There is no real or complex number solution.

Correct Answer: c)

45. Which of the following numbers is not a complex number?

- a) $5 + 2i$
- b) $1/3$
- c) $\sqrt{-16}$
- d) $-7i$

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Correct Answer: b)

46. What is the conjugate of the complex number $4 - 2i$?

- a) $4 + 2i$
- b) $-4 - 2i$
- c) $-4 + 2i$
- d) $4 + 2$

Correct Answer: a)

47. Which of the following is a purely imaginary number?

- a) $3 + 4i$
- b) -5
- c) 0
- d) $-2i$

Correct Answer: d)

48. What is the additive inverse of the complex number $2 - 3i$?

- a) $-2 + 3i$
- b) $2 - 3i$
- c) $-2 - 3i$
- d) $-2 + 3i$

Correct Answer: c)

49. If $z = 5 + 2i$ and $w = 3 - 4i$, what is the product zw ?

- a) $23 + 22i$
- b) $22 - 23i$
- c) $23 - 22i$
- d) $23 - 26i$

Correct Answer: c)

50. What is the absolute value (modulus) of the complex number $-4 + 3i$?

- a) 7
- b) -7
- c) $\sqrt{7}$
- d) $-\sqrt{7}$

Correct Answer: a)

51. Which complex number is a solution to the equation $x^2 + 4 = 0$?

- a) $2i$
- b) -2
- c) $-2i$
- d) 2

Correct Answer: b)

52. Which of the following is an irrational number?

- a) $\sqrt{25}$

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- b) 0.5
- c) $\sqrt{7}$
- d) $\frac{2}{3}$

Correct Answer: c)

53. What is a group?

- a) A set with an operation that is not associative
- b) A set with a binary operation that is closed, associative, has an identity element, and every element has an inverse
- c) A set with a binary operation that is not commutative
- d) A set with no binary operation

Correct Answer: b)

54. In a group, which property is not required for the binary operation?

- a) Closure
- b) Associativity
- c) Commutativity
- d) Identity element

Correct Answer: c)

55. Which of the following is a commutative binary operation?

- a) Matrix multiplication
- b) Addition of real numbers
- c) Composition of functions
- d) Subtraction of integers

Correct Answer: b)

56. What is a groupoid?

- a) A set with a binary operation that is not associative
- b) A set with a binary operation that is closed and associative
- c) A set with a binary operation that is not closed
- d) A set with no binary operation

Correct Answer: b)

57. Which of the following is an example of a group?

- a) The set of natural numbers with addition
- b) The set of integers with subtraction
- c) The set of real numbers with multiplication
- d) The set of rational numbers with division

Correct Answer: a)

58. In a group, what is the identity element with respect to multiplication?

- a) 0
- b) 1
- c) -1
- d) 2

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Correct Answer: b)

59. Which binary operation is not associative?

- a) Addition of real numbers
- b) Matrix multiplication
- c) Composition of functions
- d) Subtraction of integers

Correct Answer: b)

60. What is the inverse of an element in a group?

- a) The element itself
- b) The additive inverse
- c) The multiplicative inverse
- d) The identity element

Correct Answer: c)

61. Which of the following is a trigonometric identity?

- a) $\sin(2\theta) = 2\sin(\theta)$
- b) $\tan(\theta) = \sin(\theta)/\cos(\theta)$
- c) $\cos(\theta) = \sin(\theta)$
- d) $\sin(\theta) = \cos(2\theta)$

Correct Answer: b)

62. What is the Pythagorean trigonometric identity for sine and cosine?

- a) $\sin(\theta) = \cos(\theta)$
- b) $\sin^2(\theta) + \cos^2(\theta) = 1$
- c) $\tan(\theta) = \sin(\theta)/\cos(\theta)$
- d) $\cos^2(\theta) - \sin^2(\theta) = 1$

Correct Answer: b)

63. How many different ways can you arrange the letters in the word "MISSISSIPPI"?

- a) 34650
- b) 69300
- c) 114413040
- d) 1287

Correct Answer: a)

64. In how many ways can you choose 2 books from a shelf containing 7 books?

- a) 14
- b) 21
- c) 28
- d) 49

Correct Answer: b)

65. If you roll a fair six-sided die, what is the probability of getting an even number or a number less than 3?

- a) $1/6$

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- b) $\frac{1}{3}$
- c) $\frac{1}{2}$
- d) $\frac{2}{3}$

Correct Answer: c)

66. A bag contains 4 red balls and 6 green balls. What is the probability of drawing a green ball followed by another green ball without replacement?

- a) $\frac{3}{14}$
- b) $\frac{6}{15}$
- c) $\frac{2}{5}$
- d) $\frac{6}{14}$

Correct Answer: b)

67. If you draw a card from a standard deck of 52 cards, what is the probability of drawing a red card or a face card (jack, queen, king)?

- a) $\frac{1}{4}$
- b) $\frac{1}{2}$
- c) $\frac{7}{13}$
- d) $\frac{23}{52}$

Correct Answer: c)

68. In how many ways can you choose 3 different ice cream flavors from a menu with 10 different flavors?

- a) 10
- b) 20
- c) 120
- d) 720

Correct Answer: c)

69. How many different ways can you arrange 4 distinct books on a shelf?

- a) 8
- b) 16
- c) 24
- d) 12

Correct Answer: c)

70. Which trigonometric identity is used to find the tangent of the sum of two angles, θ and ϕ ?

- a) $\tan(\theta + \phi) = \tan(\theta) + \tan(\phi)$
- b) $\tan(\theta + \phi) = (\tan(\theta) + \tan(\phi))/(1 - \tan(\theta)\tan(\phi))$
- c) $\tan(\theta + \phi) = \tan(\theta)\tan(\phi)$
- d) $\tan(\theta + \phi) = \tan(\theta) - \tan(\phi)$

Correct Answer: b)

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1. What is the equation of the hyperbola with a vertical major axis, center at (0,0), foci at (0,±3), and eccentricity $e = 2$?

A) $y^2/9 - x^2/4 = 1$

B) $x^2/9 - y^2/4 = 1$

C) $x^2/4 - y^2/9 = 1$

D) $y^2/4 - x^2/9 = 1$

Correct Answer: B)

2. Given the equation of a hyperbola: $(x - 2)^2/16 - (y + 1)^2/9 = 1$. What are the coordinates of the center, foci, and vertices of this hyperbola?

A) Center: (2, 1), Foci: (6, 1) and (-2, 1), Vertices: (6, 1) and (-2, 1)

B) Center: (2, 1), Foci: (2, 4) and (2, -6), Vertices: (6, 1) and (-2, 1)

C) Center: (2, 1), Foci: (2, 3) and (2, -5), Vertices: (6, 1) and (-2, 1)

D) Center: (2, 1), Foci: (3, 1) and (-1, 1), Vertices: (6, 1) and (-2, 1)

Correct Answer: C)

3. What is the equation of a parabola with a focus at (2,3) and a directrix at $y = 7$?

A) $y = (1/4)(x - 2)^2$

B) $x = (1/4)(y - 3)^2$

C) $y = (1/4)(x - 3)^2$

D) $x = (1/4)(y - 2)^2$

Correct Answer: A)

4. A parabola has the equation $y = -2x^2$. What is the location of the vertex and the focus of this parabola?

A) Vertex: (0, 0), Focus: (0, -1/2)

B) Vertex: (0, 0), Focus: (0, 1/2)

C) Vertex: (0, 0), Focus: (0, -1)

D) Vertex: (0, 0), Focus: (0, 1)

Correct Answer: B)

Class 12th Math Past Paper

5. What is the equation of an ellipse with a major axis along the x-axis, center at (3,2), major axis of length 10, and minor axis of length 6?

- A) $(x - 3)^2/25 + (y - 2)^2/9 = 1$
B) $(x - 3)^2/100 + (y - 2)^2/36 = 1$
C) $(x - 3)^2/36 + (y - 2)^2/100 = 1$
D) $(x - 3)^2/9 + (y - 2)^2/25 = 1$

Correct Answer: A)

6. If the equation of an ellipse is $(x - 2)^2/16 + (y + 1)^2/25 = 1$, what are the coordinates of the center, foci, and vertices of this ellipse?

- A) Center: (2, 1), Foci: (6, 1) and (-2, 1), Vertices: (6, 1) and (-2, 1)
B) Center: (2, 1), Foci: (2, 6) and (2, -4), Vertices: (6, 1) and (-2, 1)
C) Center: (2, 1), Foci: (2, 7) and (2, -5), Vertices: (6, 1) and (-2, 1)
D) Center: (2, 1), Foci: (4, 1) and (0, 1), Vertices: (6, 1) and (-2, 1)

Correct Answer: B)

7. Given the equation of a hyperbola: $25x^2 - 16y^2 = 400$. What are the coordinates of the center, foci, and vertices of this hyperbola?

- A) Center: (0, 0), Foci: (5, 0) and (-5, 0), Vertices: (4, 0) and (-4, 0)
B) Center: (0, 0), Foci: (5, 0) and (-5, 0), Vertices: (5, 0) and (-5, 0)
C) Center: (0, 0), Foci: (4, 0) and (-4, 0), Vertices: (5, 0) and (-5, 0)
D) Center: (0, 0), Foci: (4, 0) and (-4, 0), Vertices: (4, 0) and (-4, 0)

Correct Answer: B)

8. Consider the parabola with the equation $y = 4x^2 + 8x + 3$. What are the coordinates of the vertex, focus, and directrix of this parabola?

- A) Vertex: (-2, 3), Focus: (-2, 2), Directrix: $y = 4$
B) Vertex: (-2, 3), Focus: (-2, 4), Directrix: $y = 2$
C) Vertex: (-2, 3), Focus: (-2, 3), Directrix: $y = 2$
D) Vertex: (-2, 3), Focus: (-2, 3), Directrix: $y = 4$

Correct Answer: C)

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9. What is the equation of an ellipse with a major axis along the y-axis, center at (1,2), major axis of length 10, and minor axis of length 6?

- A) $(x - 1)^2/25 + (y - 2)^2/9 = 1$
- B) $(x - 1)^2/36 + (y - 2)^2/100 = 1$
- C) $(x - 1)^2/9 + (y - 2)^2/25 = 1$
- D) $(x - 1)^2/16 + (y - 2)^2/100 = 1$

Correct Answer: D)

10. Given the equation of an ellipse: $9x^2 + 4y^2 = 36$. What are the coordinates of the center, foci, and vertices of this ellipse?

- A) Center: (0, 0), Foci: (3, 0) and (-3, 0), Vertices: (3, 0) and (-3, 0)
- B) Center: (0, 0), Foci: (2, 0) and (-2, 0), Vertices: (3, 0) and (-3, 0)
- C) Center: (0, 0), Foci: (3, 0) and (-3, 0), Vertices: (4, 0) and (-4, 0)
- D) Center: (0, 0), Foci: (4, 0) and (-4, 0), Vertices: (3, 0) and (-3, 0)

Correct Answer: A)

11. In three-dimensional space, what is the direction vector of a straight line passing through the points (1, 2, 3) and (4, 5, 6)?

- A) $\langle 3, 3, 3 \rangle$
- B) $\langle 1, 1, 1 \rangle$
- C) $\langle 5, 5, 5 \rangle$
- D) $\langle 2, 2, 2 \rangle$

Correct Answer: A)

12. Consider two 3D straight lines: Line A with the direction vector $\langle 1, -2, 3 \rangle$ and Line B with the direction vector $\langle 2, -4, 6 \rangle$. Are these two lines parallel or perpendicular?

- A) Parallel
- B) Perpendicular
- C) Neither

Correct Answer: B)

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13. If a 3D straight line with the direction vector $\langle 1, 2, -3 \rangle$ passes through the point $(2, -1, 4)$, what is the equation of the line in vector form?

- A) $r = \langle 2, -1, 4 \rangle + t\langle 1, 2, -3 \rangle$
- B) $r = \langle 1, 2, -3 \rangle + t\langle 2, -1, 4 \rangle$
- C) $r = \langle 1, 2, -3 \rangle + t\langle 1, 2, -3 \rangle$
- D) $r = \langle 2, -1, 4 \rangle - t\langle 1, 2, -3 \rangle$

Correct Answer: A)

14. In a 3D coordinate system, if two straight lines are neither parallel nor perpendicular, what is the relationship between their direction vectors?

- A) The direction vectors are collinear.
- B) The direction vectors are linearly independent.
- C) The direction vectors are orthogonal.
- D) The direction vectors are equal.

Correct Answer: B)

15. What is the gradient of a straight line passing through the points $(3, 4)$ and $(7, 8)$?

- A) 1
- B) 2
- C) 3
- D) 4

Correct Answer: B)

16. Consider the straight line with equation $2x - 3y = 6$. What is the gradient of this line?

- A) $2/3$
- B) $-2/3$
- C) $3/2$
- D) $-3/2$

Correct Answer: A)

17. If a straight line has a gradient of -4 and passes through the point $(5, 6)$, what is its equation in the point-slope form?

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A) $y = -4x + 26$

B) $y = -4x + 14$

C) $y = -4x + 46$

D) $y = -4x + 22$

Correct Answer: D)

18. Given a straight line with the equation $3y - 4x = 12$, what is the angle (in degrees) between this line and the x-axis?

A) 37.5 degrees

B) 45 degrees

C) 60 degrees

D) 75 degrees

Correct Answer: B)

19. Consider the function $f(n) = 2n - 3$. What is the value of $f(5)$?

A) 7

B) 10

C) 9

D) 11

Correct Answer: B)

20. If $g(n) = n^2 + 3n - 2$, what is the value of $g(4)$?

A) 20

B) 14

C) 26

D) 18

Correct Answer: D)

21. Let $h(n)$ be defined as $h(n) = 3n - 1$. What is the value of $h(7)$?

A) 14

B) 20

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C) 22

D) 18

Correct Answer: C)

22. Consider a function $p(n) = n^3 - 2n^2 + 4n$. What is $p(3)$?

A) 27

B) 9

C) 18

D) 21

Correct Answer: B)

23. If $q(n)$ is a function defined as $q(n) = 2^n$, what is the value of $q(4)$?

A) 8

B) 16

C) 32

D) 64

Correct Answer: C)

24. Consider the function $r(n) = \sqrt{n} + 7$. What is the value of $r(36)$?

A) 13

B) 19

C) 7

D) 10

Correct Answer: A)

25. Let $s(n)$ be a function defined as $s(n) = 4n - 5$. What is the value of $s(10)$?

A) 35

B) 40

C) 45

D) 50

Correct Answer: B)

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26. If $t(n)$ is a function defined as $t(n) = 2^n - n$, what is the value of $t(2)$?

- A) 0
- B) 2
- C) 4
- D) 6

Correct Answer: C)

27. What is the integral of $x^4 e^{(x^5)}$ with respect to x ?

- A) $e^{(x^5)} + C$
- B) $e^{(x^5)}/5 + C$
- C) $(1/5)e^{(x^5)} + C$
- D) $(1/2)e^{(x^5)} + C$

Correct Answer: C)

28. What is the integral of $\sin^2(x)\cos(x)$ with respect to x ?

- A) $-\cos^3(x)/3 + C$
- B) $\cos^3(x)/3 + C$
- C) $\sin^3(x)/3 + C$
- D) $-\sin^3(x)/3 + C$

Correct Answer: A)

29. What is the integral of $\ln(x)$ with respect to x ?

- A) $x\ln(x) - x + C$
- B) $x\ln(x) + x + C$
- C) $-x\ln(x) + x + C$
- D) $-x\ln(x) - x + C$

Correct Answer: A)

30. What is the integral of $\sqrt{x}$ with respect to x ?

- A) $(2/3)x^{(3/2)} + C$

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B) $(\frac{2}{3})x^{(1/2)} + C$

C) $(\frac{3}{2})x^{(3/2)} + C$

D) $(\frac{3}{2})x^{(1/2)} + C$

Correct Answer: A)

31. What is the integral of $(2x + 1)/(x^2 + x)$ with respect to x ?

A) $\ln|x| + C$

B) $2\ln|x| + C$

C) $2\ln(x) + C$

D) $\ln(2x) + C$

Correct Answer: B)

32. What is the integral of $(2\cos(x) + 3\sin(x))$ with respect to x ?

A) $2\sin(x) + 3\cos(x) + C$

B) $2\sin(x) - 3\cos(x) + C$

C) $-2\sin(x) + 3\cos(x) + C$

D) $-2\sin(x) - 3\cos(x) + C$

Correct Answer: C)

33. What is the integral of $(x^2 - 2x + 3)dx$?

A) $(\frac{1}{3})x^3 - x^2 + 3x + C$

B) $(\frac{1}{3})x^3 - x^2 + 3x^2 + C$

C) $(\frac{1}{3})x^3 - x^2 + 3x^3 + C$

D) $(\frac{1}{3})x^3 - 2x^2 + 3x + C$

Correct Answer: A)

34. What is the integral of $1/(1 + e^x)$ with respect to x ?

A) $\ln(1 + e^x) + C$

B) $\ln(1 - e^x) + C$

C) $-\ln(1 + e^x) + C$

D) $\ln(e^x - 1) + C$

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Correct Answer: C)

35. What is the integral of $e^{(2x)}$ with respect to x ?

A) $(1/2)e^{(2x)} + C$

B) $2e^{(2x)} + C$

C) $(1/4)e^{(2x)} + C$

D) $e^{(2x)} + C$

Correct Answer: A)

36. What is the integral of $4x^3 + 2x^2 - 5x + 1$ with respect to x ?

A) $x^4 + (2/3)x^3 - (5/2)x^2 + x + C$

B) $x^4 + 2x^3 - 5x^2 + x + C$

C) $x^4/4 + (2/3)x^3 - 5x^2/2 + x + C$

D) $4x^4 + (2/3)x^3 - 5x^2 + C$

Correct Answer: C)

37. What is the integral of $(1 - x^2)$ with respect to x ?

A) $x - x^3/3 + C$

B) $x - x^3 + C$

C) $1 - x^2 + C$

D) $1 - x^2/2 + C$

Correct Answer: A)

38. What is the integral of $3e^{(4x)}$ with respect to x ?

A) $3e^{(4x)} + C$

B) $(3/4)e^{(4x)} + C$

C) $12e^{(4x)} + C$

D) $(3/16)e^{(4x)} + C$

Correct Answer: B)

39. What is the integral of $2x$ with respect to x ?

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A) $x^2 + C$

B) x^2

C) $2x^2$

D) $2x^2 + C$

Correct Answer: D)

40. What is the derivative of the constant function $f(x) = 5$ with respect to x ?

A) 0

B) 5

C) 1

D) 10

Correct Answer: A)

41. What is the derivative of the function $g(x) = 3x^2$ with respect to x ?

A) $6x$

B) $2x$

C) $3x$

D) $9x$

Correct Answer: A)

42. Find the derivative of the function $h(x) = 4x^3 - 2x^2 + 7x - 1$ with respect to x .

A) $12x^2 - 4x + 7$

B) $6x^2 - 4x + 7$

C) $12x^2 - 2x + 7$

D) $6x^2 - 2x + 7$

Correct Answer: A)

43. What is the derivative of the function $y = \sqrt{x}$ with respect to x ?

A) $\frac{1}{2}\sqrt{x}$

B) $\sqrt{x}$

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C) $2\sqrt{x}$

D) $1/(2\sqrt{x})$

Correct Answer: A)

44. Find the derivative of the function $f(x) = e^x$ with respect to x .

A) e^x

B) $\ln(x)$

C) e

D) 1

Correct Answer: A)

45. What is the derivative of the function $g(x) = \ln(x)$ with respect to x ?

A) $1/x$

B) $\ln(x)$

C) x

D) e^x

Correct Answer: A)

46. Calculate the derivative of the function $h(x) = 2\sin(3x)$ with respect to x .

A) $2\cos(3x)$

B) $6\cos(3x)$

C) $3\cos(3x)$

D) $2\sin(3x)$

Correct Answer: B)

47. Find the derivative of the function $y = 1/x$ with respect to x .

A) $-1/x^2$

B) $1/x$

C) $-x$

D) $\ln(x)$

Correct Answer: A)

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48. What is the derivative of the function $f(x) = 4e^{(2x)}$ with respect to x ?

- A) $8e^{(2x)}$
- B) $2e^{(4x)}$
- C) $4e^{(2x)}$
- D) $8e^{(4x)}$

Correct Answer: C)

49. Calculate the derivative of the function $g(x) = 2x^2 - 3x + 5$ with respect to x .

- A) $4x - 3$
- B) $4x^2 - 3x$
- C) $2x - 3$
- D) $2x^2 - 3$

Correct Answer: A)

50. Find the derivative of the function $y = 5x^{(-2)}$ with respect to x .

- A) $-10x^{(-3)}$
- B) $-5x^{(-3)}$
- C) $-5x^{(-1)}$
- D) $-10x^{(-1)}$

Correct Answer: A)

51. What is the derivative of the function $h(x) = 3\cos(4x)$ with respect to x ?

- A) $-3\sin(4x)$
- B) $4\cos(4x)$
- C) $-12\sin(4x)$
- D) $-12\cos(4x)$

Correct Answer: C)

52. Calculate the derivative of the function $f(x) = \ln(3x^2)$ with respect to x .

- A) $(\frac{2}{3})x$

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B) $(\frac{2}{3})x^2$

C) $\frac{6}{x}$

D) $(\frac{4}{3})x$

Correct Answer: D)

53. Find the derivative of the function $g(x) = x^4 + 2x^3 - 5x^2 + 1$ with respect to x .

A) $4x^3 + 6x^2 - 10x$

B) $x^5 + 6x^4 - 10x^3$

C) $4x^5 + 6x^4 - 10x^3$

D) $4x^3 + 6x^2 - 10$

Correct Answer: A)

54. What is the derivative of the function $y = e^{(2x)}\sin(3x)$ with respect to x ?

A) $2e^{(2x)}\cos(3x) + 3e^{(2x)}\sin(3x)$

B) $2e^{(2x)}\cos(3x) - 3e^{(2x)}\sin(3x)$

C) $4e^{(2x)}\cos(3x)$

D) $e^{(2x)}\cos(3x) + 3e^{(2x)}\sin(3x)$

Correct Answer: A)

55. In engineering, what does the derivative of a stress function with respect to a material's deformation represent?

A) Strain

B) Force

C) Elasticity

D) Young's modulus

Correct Answer: A)

56. What does the derivative of a temperature function with respect to distance represent in heat transfer problems?

A) Heat flux

B) Thermal conductivity

C) Temperature gradient

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D) Specific heat

Correct Answer: C)

57. In optimization problems, what does finding the critical points (where the derivative is zero) often help determine?

A) Minimum and maximum values

B) Rate of change

C) Concavity

D) Slope of a tangent line

Correct Answer: A)

58. In engineering, what does the derivative of a displacement function with respect to time represent in the context of oscillations and waves?

A) Frequency

B) Amplitude

C) Phase angle

D) Velocity

Correct Answer: D)

59. If two circles are tangent externally, what is the relationship between their radii?

A) The sum of the radii is equal to the distance between the centers.

B) The difference between the radii is equal to the distance between the centers.

C) The sum of the radii is greater than the distance between the centers.

D) The difference between the radii is greater than the distance between the centers.

Correct Answer: B)

60. In a circle with radius 6 cm, what is the length of an arc subtended by a central angle of 60 degrees?

A) 3π cm

B) 3 cm

C) 6π cm

D) 6 cm

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Correct Answer: B)

61. What is the equation of the tangent line to the circle $(x - 2)^2 + (y + 3)^2 = 9$ at the point (4, -3)?

A) $x - 2y = 14$

B) $x + 2y = 14$

C) $x - 2y = 20$

D) $x + 2y = 20$

Correct Answer: A)

62. If the equation of a circle is $x^2 + y^2 + 2x - 4y - 11 = 0$, what are the coordinates of its center?

A) (-1, 2)

B) (-1, -2)

C) (1, -2)

D) (1, 2)

Correct Answer: C)

63. What is the area of a sector of a circle with a central angle of 120 degrees in a circle with a radius of 8 units?

A) 24π square units

B) 48 square units

C) 16π square units

D) 96 square units

Correct Answer: B)

64. Which of the following is an example of a scalar quantity?

A) Velocity

B) Displacement

C) Speed

D) Force

Correct Answer: C)

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65. When adding two vectors, which of the following is true for the resultant vector to have the smallest magnitude?

- A) The two vectors are perpendicular to each other.
- B) The two vectors are parallel to each other.
- C) The two vectors are anti-parallel to each other.
- D) The two vectors are at random angles to each other.

Correct Answer: C)

66. Which of the following vector operations results in a scalar quantity?

- A) Vector addition
- B) Vector subtraction
- C) Scalar multiplication
- D) Cross product

Correct Answer: D)

67. If you walk 5 meters east and then 3 meters north, what is the magnitude of your displacement?

- A) 8 meters
- B) 2 meters
- C) 5 meters
- D) 3 meters

Correct Answer: B)

68. What is the angle between two vectors when their dot product is zero?

- A) 90 degrees
- B) 0 degrees
- C) 45 degrees
- D) 180 degrees

Correct Answer: A)

69. Which of the following is a vector quantity?

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A) Temperature

B) Energy

C) Acceleration

D) Volume

Correct Answer: C)

70. In a displacement vector, what does the magnitude represent?

A) The direction

B) The point of application

C) The distance

D) The speed

Correct Answer: C)

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1. What is the value of x in the equation $3x - 7 = 2x + 5$?
- A) 12
 - B) 6
 - C) -12
 - D) -6

Correct Answer: D)

2. If a triangle has angles measuring 30 degrees, 60 degrees, and x degrees, what is the value of x ?
- A) 90 degrees
 - B) 45 degrees
 - C) 120 degrees
 - D) 75 degrees

Correct Answer: C)

3. If the perimeter of a rectangle is 36 cm and one side is 9 cm long, what is the length of the other side?
- A) 6 cm
 - B) 9 cm
 - C) 12 cm
 - D) 15 cm

Correct Answer: C)

4. Simplify the expression: $(4x^2 - 3x + 2) / (2x - 1)$
- A) $2x - 2$
 - B) $2x + 1$
 - C) $2x - 1$
 - D) $2x + 2$

Correct Answer: A)

5. If the ratio of boys to girls in a class is 3:5, and there are 24 girls, how many boys are in the class?
- A) 8
 - B) 12
 - C) 18
 - D) 15

Correct Answer: A)

6. Solve for x in the equation: $2(3x - 5) = 4x + 6$.
- A) 2
 - B) 3
 - C) 4
 - D) 5

Correct Answer: B)

7. If a circle has a radius of 7 cm, what is its approximate circumference?

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- A) 14 cm
- B) 22 cm
- C) 44 cm
- D) $44/7$ cm

Correct Answer: B)

8. What is the area of a triangle with a base of 10 cm and a height of 8 cm?

- A) 40 square cm
- B) 60 square cm
- C) 80 square cm
- D) 20 square cm

Correct Answer: A)

9. If $3x + 4 = 16$, what is the value of x ?

- A) 4
- B) 5
- C) 6
- D) 7

Correct Answer: C)

10. In a deck of playing cards, what is the probability of drawing a red card (hearts or diamonds)?

- A) $1/4$
- B) $1/2$
- C) $3/4$
- D) $1/3$

Correct Answer: C)

11. The degree of polynomial $4x^4 + 2x^2y$ is _____

- A) 1
- B) 2
- C) 3
- D) 4

Correct Answer: D)

12. What is the result of multiplying a 2×3 matrix by a 3×4 matrix?

- A) A 2×4 matrix
- B) A 2×3 matrix
- C) A 3×3 matrix
- D) A 3×4 matrix

Correct Answer: A)

13. What is the determinant of a 2×2 matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$?

- A) $ad - bc$
- B) $ab + cd$
- C) $ac + bd$
- D) $(a + d)(b + c)$

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Correct Answer: A)

14. In three-dimensional space, a vector has components (2, -3, 1). What is the magnitude of this vector?

- A) $\sqrt{14}$
- B) $\sqrt{6}$
- C) $\sqrt{18}$
- D) 6

Correct Answer: B)

15. The dot product of two vectors is 0. What can you conclude about the angle between them?

- A) The angle is 90 degrees (perpendicular).
- B) The angle is 45 degrees.
- C) The angle is 180 degrees (opposite).
- D) The angle is 0 degrees (collinear).

Correct Answer: A)

16. 5. In set notation, what does the intersection of sets A and B represent?

- A) All elements that are in either set A or set B.
- B) All elements that are in both set A and set B.
- C) All elements that are only in set A.
- D) All elements that are only in set B.

Correct Answer: B)

17. If set $X = \{1, 2, 3\}$ and set $Y = \{3, 4, 5\}$, what is the union of sets X and Y?

- A) $\{1, 2, 3, 4, 5\}$
- B) $\{1, 2, 3\}$
- C) $\{3\}$
- D) $\{4, 5\}$

Correct Answer: A)

18. What is the complement of a set A with respect to a universal set U?

- A) The set of all elements in A.
- B) The set of all elements in U but not in A.
- C) The set of all elements in A but not in U.
- D) The set of all prime numbers.

Correct Answer: B)

19. How many subsets can be formed from a set with 4 elements?

- A) 4
- B) 8
- C) 16
- D) 32

Correct Answer: B)

20. What is the primary purpose of a hire purchase agreement?

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- A) To purchase a product with cash
- B) To lease a product for a short period
- C) To buy a product through installment payments
- D) To rent a product indefinitely

Correct Answer: C)

21. In a hire purchase agreement, who owns the item during the repayment period?

- A) The buyer
- B) The seller
- C) Both parties jointly
- D) The finance company

Correct Answer: D)

22. If an item is bought for \$100 and sold for \$120, what is the profit percentage?

- A) 10%
- B) 12%
- C) 15%
- D) 20%

Correct Answer: A)

23. If a product is sold at a loss of 20%, and the cost price is \$200, what is the selling price?

- A) \$220
- B) \$180
- C) \$160
- D) \$240

Correct Answer: B) \$180

24. If you deposit \$1,000 in a bank account with a 5% annual interest rate, how much will you have after one year?

- A) \$1,050
- B) \$950
- C) \$1,100
- D) \$1,025

Correct Answer: A)

25. What is compound interest?

- A) Interest calculated only on the principal amount
- B) Interest calculated on both the principal and previously earned interest
- C) Interest calculated monthly
- D) Interest paid by the borrower to the lender

Correct Answer: B)

26. Which of the following is not typically deductible from taxable income for individuals?

- A) Mortgage interest
- B) Medical expenses
- C) Charitable donations

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D) Rent payments

Correct Answer: D)

27. What is the term for the portion of income that is not subject to income tax?

A) Taxable income

B) Gross income

C) Tax exemption

D) Tax deduction

Correct Answer: C)

28. What is the standard rate of GST in many countries?

A) 5%

B) 10%

C) 15%

D) 20%

Correct Answer: B)

29. In a GST-inclusive price of \$110, if the GST rate is 10%, what is the original price before GST?

A) \$100

B) \$120

C) \$90

D) \$10

Correct Answer: A)

30. A salesperson earns a 5% commission on each sale. If they make a sale of \$500, how much commission do they earn?

A) \$5

B) \$10

C) \$25

D) \$50

Correct Answer: C)

31. If a real estate agent receives a 3% commission on the sale of a house for \$300,000, how much is their commission?

A) \$3,000

B) \$9,000

C) \$30,000

D) \$900

Correct Answer: A)

32. What is the probability of rolling a 6 on a fair six-sided die?

A) $\frac{1}{6}$

B) $\frac{1}{2}$

C) $\frac{1}{3}$

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D) 1

Correct Answer: A)

33. If you flip a coin, what is the probability of getting heads or tails?

A) $\frac{1}{6}$

B) $\frac{1}{2}$

C) $\frac{2}{3}$

D) 1

Correct Answer: B)

34. In a right-angled triangle, the side opposite the right angle is called:

A) Hypotenuse

B) Adjacent

C) Opposite

D) Base

Correct Answer: A)

35. In a right-angled triangle, the tangent of an angle is equal to:

A) Opposite / Adjacent

B) Hypotenuse / Base

C) Base / Hypotenuse

D) Adjacent / Opposite

Correct Answer: A)

36. In a right-angled triangle, if one side is 4 and the other is 3, what is the length of the hypotenuse?

A) 7

B) 5

C) 12

D) 9

Correct Answer: B)

37. Which of the following is the Pythagorean theorem?

A) $a^2 = b^2 + c^2$

B) $a^2 = b^2 - c^2$

C) $a^2 = b^2 * c^2$

D) $a^2 = b + c$

Correct Answer: A) $a^2 = b^2 + c^2$

38. What is the perimeter of a square with sides of length 8 cm?

A) 32 cm

B) 64 cm

C) 16 cm

D) 24 cm

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Correct Answer: A)

39. The formula to find the surface area of a cube is:

- A) $6 \times \text{side length}$
- B) $4 \times \text{side length}$
- C) $2 \times \text{side length}$
- D) side length^2

Correct Answer: A)

40. What is the next number in the sequence: 2, 5, 10, 17, ...?

- A) 22
- B) 24
- C) 26
- D) 28

Correct Answer: C)

41. If a number is divisible by 2 and 3, it is also divisible by:

- A) 4
- B) 5
- C) 6
- D) 7

Correct Answer: C)

42. If the ratio of boys to girls in a class is 2:3, and there are 15 girls, how many boys are in the class?

- A) 5
- B) 10
- C) 7
- D) 12

Correct Answer: B)

43. If a recipe calls for 2 cups of sugar and 3 cups of flour, what is the sugar-to-flour ratio?

- A) 2:3
- B) 3:2
- C) 5:6
- D) 2:5

Correct Answer: A)

44. If a car travels at a constant speed of 60 miles per hour, how long will it take to cover a distance of 120 miles?

- A) 1 hour
- B) 2 hours
- C) 3 hours
- D) 4 hours

Correct Answer: B)

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45. If a train travels 300 miles in 5 hours, what is its speed in miles per hour?

- A) 60 mph
- B) 65 mph
- C) 55 mph
- D) 70 mph

Correct Answer: A)

46. What is the formula for distance traveled when speed and time are known?

- A) Distance = Speed x Time
- B) Speed = Distance x Time
- C) Time = Speed / Distance
- D) Time = Distance / Speed

Correct Answer: A)

47. If a cyclist rides at a speed of 15 km/h for 2 hours, how far does the cyclist travel?

- A) 30 km
- B) 15 km
- C) 7.5 km
- D) 45 km

Correct Answer: A)

48. What is the equivalent of 5 kilometers in meters?

- A) 500 meters
- B) 5,000 meters
- C) 50 meters
- D) 0.5 meters

Correct Answer: B)

49. How many liters are in 1,000 milliliters?

- A) 10 liters
- B) 1 liter
- C) 100 liters
- D) 0.1 liter

Correct Answer: D)

50. What is the metric prefix "kilo" equivalent to?

- A) 100
- B) 1,000
- C) 10,000
- D) 100,000

Correct Answer: B)

51. What is the prefix "micro" symbolized by?

- A) μ
- B) m
- C) M

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D) μ

Correct Answer: A) μ

52. Which of the following is an ordinary number?

A) π

B) e

C) $\sqrt{2}$

D) 0

Correct Answer: D)

53. What is the standard form of the number 0.000025?

A) 2.5×10^{-5}

B) 2.5×10^{-4}

C) 2.5×10^{-3}

D) 2.5×10^{-6}

Correct Answer: A)

54. In a circle, what is the relationship between the radius and the diameter?

A) Diameter = 2 * Radius

B) Diameter = Radius

C) Diameter = 3 * Radius

D) Diameter = 0.5 * Radius

Correct Answer: A)

55. If the circumference of a circle is 12π units, what is its radius?

A) 3 units

B) 6 units

C) 12 units

D) 18 units

Correct Answer: A)

56. What is the formula for the surface area of a trapezium?

A) $\frac{1}{2} * (a + b) * h$

B) $2 * (a + b) * h$

C) $(a + b) / 2 * h$

D) $(a - b) * h$

Correct Answer: A)

57. In a trapezium, if the lengths of the parallel sides are 5 cm and 7 cm, and the height is 4 cm, what is the surface area?

A) 18 square cm

B) 24 square cm

C) 30 square cm

D) 35 square cm

Correct Answer: B)

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58. What is the common factor in the expression $2x^2 + 4x$?

- A) $2x$
- B) $4x$
- C) x
- D) 2

Correct Answer: A)

59. Factorize the expression $x^2 - 9$.

- A) $(x + 3)(x - 3)$
- B) $(x + 9)(x - 9)$
- C) $(x + 6)(x - 6)$
- D) $(x - 9)(x - 9)$

Correct Answer: A)

60. What is the factored form of $4x^3 - 16x$?

- A) $4x(x - 4)(x + 1)$
- B) $4x(x - 4)(x - 1)$
- C) $4(x - 4)(x + 1)$
- D) $4(x - 4)(x - 1)$

Correct Answer: A)

61. Factorize the expression $3a^2b + 6ab^2$.

- A) $3ab(a + 2b)$
- B) $3ab^2(a + 2b)$
- C) $3(a + 2b)$
- D) $6ab(a + 2b)$

Correct Answer: A)

62. What is the factored form of $5x^2 - 20x + 15$?

- A) $5(x - 3)(x - 1)$
- B) $5(x + 3)(x - 5)$
- C) $5(x - 5)(x - 3)$
- D) $5(x + 5)(x + 3)$

Correct Answer: A)

63. Factorize the expression $2y^2 - 8y - 6$.

- A) $2(y - 3)(y - 1)$
- B) $2(y + 3)(y - 1)$
- C) $2(y - 3)(y + 1)$
- D) $2(y + 3)(y + 1)$

Correct Answer: A)

64. What is the factored form of $x^4 - 16$?

- A) $(x^2 - 4)(x^2 + 4)$
- B) $(x^2 + 4)(x^2 - 4)$
- C) $(x^2 - 4)(x^2 - 4)$

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D) $(x^2 + 4)(x^2 + 4)$

Correct Answer: A)

65. Factorize the expression $6p^3q - 12pq^2$.

A) $6pq(p^2 - 2q)$

B) $6pq^2(p - 2q)$

C) $6pq^2(2p - q)$

D) $6p^2q(p - 2q)$

Correct Answer: B)

66. What is the factored form of $25x^2 - 4y^2$?

A) $(5x - 2y)(5x + 2y)$

B) $(5x + 2y)(5x - 2y)$

C) $(5x - 4y)(5x + 4y)$

D) $(5x + 4y)(5x - 4y)$

Correct Answer: A)

67. Factorize the expression $a^3 - 27b^3$.

A) $(a - 3b)(a^2 + 3ab + 9b^2)$

B) $(a + 3b)(a^2 - 3ab + 9b^2)$

C) $(a - 3b)(a^2 - 3ab + 9b^2)$

D) $(a + 3b)(a^2 + 3ab + 9b^2)$

Correct Answer: A)

68. When you divide $(4a^2b - 8ab^2)$ by $4ab$, what is the simplified expression?

A) $a - 2b$

B) $a^2 - 2b^2$

C) $a - 2ab$

D) $a^2 - 2ab^2$

Correct Answer: A)

69. What is the result of dividing $(6x^3 - 12x^2 + 18x)$ by $6x$?

A) $x^2 - 2x + 3$

B) $x^2 - 2x$

C) $x^2 - 12x + 3$

D) $x^2 - 12x$

Correct Answer: A)

70. When you divide $(5a^3b^2 - 10a^2b^3)$ by $5ab^2$, what is the simplified expression?

A) $a^2 - 2b$

B) $a^2 - 2ab$

C) $a - 2b$

D) $a^2 - 2b^2$

Correct Answer: A)

A-Levels Math Past Paper

A level Maths

1. What is the discriminant of the quadratic equation $2x^2 - 5x + 2 = 0$?

- A) 1
- B) 9
- C) -1
- D) 5

Correct Answer: B)

2. If $f(x) = 2x + 3$ and $g(x) = x^2 - 1$, what is the composite function $(f \circ g)(x)$?

- A) $2x^2 - 2$
- B) $2x^2 + 6x + 3$
- C) $x^2 + 5$
- D) $2x^2 - 6x + 3$

Correct Answer: D)

3. In which quadrant does the point (3, -4) lie?

- A) First quadrant
- B) Second quadrant
- C) Third quadrant
- D) Fourth quadrant

Correct Answer: C)

4. What is the value of $\sin(60 \text{ degrees})$?

- A) $1/2$
- B) $\sqrt{3}/2$
- C) 1
- D) $3/2$

Correct Answer: B)

5. If $f(x) = 3x^2 - 2x$, what is the derivative of $f(x)$ with respect to x ?

- A) $6x - 2$
- B) $6x + 2$
- C) $2x - 2$
- D) $3x - 1$

Correct Answer: A)

6. What is the integral of $2x$ with respect to x ?

- A) x^2
- B) $2x^2$
- C) $x^2 + C$
- D) $2x + C$

Correct Answer: A)

7. What is the logarithm of 1000 to the base 10?

- A) 2
- B) 3
- C) 4
- D) 5

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Correct Answer: B)

8. According to Newton's second law of motion, what is the relationship between force (F), mass (m), and acceleration (a)?

- A) $F = ma$
- B) $F = m/a$
- C) $F = a/m$
- D) $F = m^2/a$

Correct Answer: A)

9. If an object moves with a constant velocity of 5 m/s for 10 seconds, how far will it travel?

- A) 15 m
- B) 20 m
- C) 25 m
- D) 50 m

Correct Answer: B)

10. Which of the following is a unit of work?

- A) Joule
- B) Watt
- C) Newton
- D) Hertz

Correct Answer: A)

11. What is the radian measure of a full circle (360 degrees)?

- A) π radians
- B) 2π radians
- C) 3π radians
- D) 4π radians

Correct Answer: B)

12. What is the sum of the first 5 positive integers?

- A) 10
- B) 15
- C) 20
- D) 25

Correct Answer: B)

13. The momentum of an object is defined as the product of its:

- A) Mass and velocity
- B) Mass and acceleration
- C) Force and time
- D) Work and distance

Correct Answer: A)

A-Levels Math Past Paper

14. For the quadratic equation $3x^2 + 4x - 2 = 0$, what are the roots using the quadratic formula?

- A) $x = 2/3, x = -3/2$
- B) $x = -2/3, x = 3/2$
- C) $x = -2/3, x = -3/2$
- D) $x = 2/3, x = 3/2$

Correct Answer: A)

15. If $f(x) = |x|$ and $g(x) = x^2$, what is the range of the composite function $(f \circ g)(x)$?

- A) All real numbers
- B) All positive real numbers
- C) All non-negative real numbers
- D) All non-positive real numbers

Correct Answer: C)

16. Find the distance between the points (3, 4) and (-1, 2).

- A) $\sqrt{10}$
- B) $\sqrt{13}$
- C) $\sqrt{17}$
- D) $\sqrt{20}$

Correct Answer: B)

17. In a right triangle, if the sine of an acute angle is $3/5$, what is the cosine of that angle?

- A) $4/5$
- B) $5/4$
- C) $4/3$
- D) $3/4$

Correct Answer: A)

18. Find the derivative of the function $f(x) = e^{(2x)} * \cos(3x)$.

- A) $2e^{(2x)} * \sin(3x) - 3e^{(2x)} * \cos(3x)$
- B) $2e^{(2x)} * \cos(3x) - 3e^{(2x)} * \sin(3x)$
- C) $2e^{(2x)} + 3e^{(2x)}$
- D) $2e^{(2x)} - 3e^{(2x)}$

Correct Answer: A)

19. What is the integral of $(x^3 + 2x^2) dx$?

- A) $(1/4)x^4 + (2/3)x^3 + C$
- B) $(1/4)x^4 + (2/3)x^3$
- C) $(1/3)x^4 + (2/4)x^3 + C$
- D) $(1/3)x^4 + (2/4)x^3$

Correct Answer: A)

20. If $2^{(3x)} = 8$, what is the value of x ?

- A) 1
- B) 2
- C) 3
- D) 4

Correct Answer: A)

A-Levels Math Past Paper

21. In a system of forces in equilibrium, the vector sum of all forces is equal to:

- A) Zero
- B) The weight of an object
- C) The normal force
- D) The applied force

Correct Answer: A)

22. If an object is dropped from a height of 100 meters, how long will it take to hit the ground? (Assume $g = 9.8 \text{ m/s}^2$)

- A) 2.03 seconds
- B) 3.17 seconds
- C) 4.51 seconds
- D) 5.67 seconds

Correct Answer: B)

23. Which of the following statements about momentum is true?

- A) Momentum is a scalar quantity
- B) Momentum is conserved in all collisions
- C) Momentum depends on the object's weight
- D) Momentum is measured in joules

Correct Answer: B)

24. According to Newton's third law of motion, if object A exerts a force on object B, what is the reaction?

- A) Object B exerts an equal and opposite force on object A
- B) Object B exerts a force in the same direction as object A
- C) Object A exerts a larger force on object B
- D) There is no reaction force

Correct Answer: A)

25. If a 500 N force is applied to lift an object vertically 5 meters, how much work is done?

- A) 1000 J
- B) 2500 J
- C) 500 J
- D) 1250 J

Correct Answer: B)

26. What is the radian measure of a 45-degree angle?

- A) $\pi/4$ radians
- B) $\pi/2$ radians
- C) π radians
- D) 2π radians

Correct Answer: A)

27. Find the sum of the first 10 terms of the geometric series 2, 6, 18, ...

- A) 364,918

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B) 437,592

C) 524,904

D) 699,872

Correct Answer: B)

28. What is the derivative of the function $f(x) = 3x^2 - 2x + 1$ with respect to x ?

A) $6x - 2$

B) $6x - 2x + 1$

C) $3x^3 - x^2$

D) $2x - 2$

Correct Answer: A)

29. If $y = 2x^3 + 4x^2 - 5x + 3$, what is the second derivative of y with respect to x ?

A) $6x^2 + 8x - 5$

B) $12x + 8$

C) $6x^2 + 8x$

D) $12x$

Correct Answer: A)

30. The derivative of a constant, such as C , is:

A) 0

B) 1

C) C

D) Undefined

Correct Answer: A)

31. If $f'(x) = 4x^3 - 2x^2 + 5x - 1$, what is the original function $f(x)$?

A) $x^4 - (2/3)x^3 + (5/2)x^2 - x + C$

B) $x^4 - (2/3)x^2 + (5/2)x - x + C$

C) $x^4 - (2/3)x^2 + (5/2)x + C$

D) $4x^4 - (2/3)x^3 + (5/2)x - 1 + C$

Correct Answer: A)

32. What is the integral of the constant function $f(x) = 7$ with respect to x ?

A) $7x$

B) $7x + C$

C) 7

D) 0

Correct Answer: B)

33. If $\int (3x^2 - 2x) dx = x^3 - x^2 + C$, what is the original function?

A) $3x^2 - 2x + C$

B) $x^3 - x^2 + 3$

C) $3x^3 - 2x^2 + C$

D) $x^3 - x^2 + C$

Correct Answer: A)

34. The integral of a constant, such as C , with respect to x is:

A) Cx

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- B) Cx^2
- C) C
- D) Undefined

Correct Answer: A)

35. If $\int (2e^x + 5\sin(x)) \, dx = 2e^x - 5\cos(x) + C$, what is the original function?

- A) $2e^x + 5\sin(x) + C$
- B) $2e^x - 5\sin(x) + C$
- C) $e^x + 5\cos(x) + C$
- D) $2e^x - 5\cos(x) + C$

Correct Answer: A)

36. In a proof by mathematical induction, what are the typical steps?

- A) Base case, hypothesis, induction step
- B) Hypothesis, conclusion, induction step
- C) Hypothesis, base case, induction step
- D) Conclusion, base case, hypothesis

Correct Answer: C)

37. Which of the following is a valid method of proof for establishing a mathematical statement?

- A) Proof by intimidation
- B) Proof by example
- C) Proof by contradiction
- D) Proof by assertion

Correct Answer: C)

38. What is the integral of the function $f(x) = 2x^2$ with respect to x ?

- A) x^2
- B) $(2/3)x^3 + C$
- C) $2x^3 + C$
- D) $(1/2)x^3 + C$

Correct Answer: B)

39. If $\int (\sin(x) + 2\cos(x)) \, dx = -\cos(x) + 2\sin(x) + C$, what is the original function?

- A) $\sin(x) + 2\cos(x) + C$
- B) $-\sin(x) + 2\cos(x) + C$
- C) $-\cos(x) + 2\sin(x) + C$
- D) $\sin(x) - 2\cos(x) + C$

Correct Answer: C)

40. In a geometric sequence, if the first term (a) is 5 and the common ratio (r) is 2, what is the third term?

- A) 5
- B) 10
- C) 15
- D) 20

Correct Answer: D)

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41. Which of the following sequences is an arithmetic sequence?

- A) 1, 4, 9, 16, 25, ...
- B) 2, 4, 8, 16, 32, ...
- C) 3, 6, 12, 24, 48, ...
- D) 1, 3, 9, 27, 81, ...

Correct Answer: C)

42. What is the sum of the first 10 positive integers?

- A) 45
- B) 55
- C) 65
- D) 100

Correct Answer: B)

43. What is the sum of the geometric series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$ to infinity?

- A) $\frac{1}{2}$
- B) 1
- C) 2
- D) Infinity

Correct Answer: B)

44. What is the derivative of the function $f(x) = 3x^4 - 2x^3 + 5x^2 - 1$ with respect to x ?

- A) $12x^3 - 6x^2 + 10x$
- B) $12x^3 - 6x^2 + 5x$
- C) $9x^4 - 6x^3 + 5x^2 - 1$
- D) $3x^5 - 2x^4 + 5x^3 - 1$

Correct Answer: A)

45. If $y = e^{(2x)} * \sin(3x)$, what is the second derivative of y with respect to x ?

- A) $12e^{(2x)} * \cos(3x) - 9e^{(2x)} * \sin(3x)$
- B) $12e^{(2x)} * \sin(3x) - 9e^{(2x)} * \cos(3x)$
- C) $4e^{(2x)} * \sin(3x) + 9e^{(2x)} * \cos(3x)$
- D) $4e^{(2x)} * \cos(3x) - 9e^{(2x)} * \sin(3x)$

Correct Answer: A)

46. Which type of graph is best suited for showing the distribution of a single continuous variable?

- A) Pie chart
- B) Line graph
- C) Histogram
- D) Bar chart

Correct Answer: C)

47. In a survey of 100 people, 40% preferred option A, 30% preferred option B, and 30% preferred option C. What is the best way to represent this data?

- A) Scatter plot
- B) Box plot
- C) Bar chart

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D) Line graph

Correct Answer: C)

48. According to Newton's second law of motion, what is the relationship between force (F), mass (m), and acceleration (a)?

A) $F = ma$

B) $F = m/a$

C) $F = a/m$

D) $F = m^2/a$

Correct Answer: A)

49. Which numerical method is used to find approximate solutions to equations when an analytical solution is not possible or practical?

A) Newton-Raphson method

B) Fundamental theorem of calculus

C) Simpson's rule

D) Chain rule

Correct Answer: A)

50. Which numerical method is commonly used to approximate the area under a curve by dividing it into smaller trapezoids?

A) Simpson's rule

B) Euler's method

C) Trapezoidal rule

D) Gaussian quadrature

Correct Answer: C)

51. What type of graph is most suitable for displaying data that changes over time, such as stock prices over a month?

A) Bar chart

B) Scatter plot

C) Line graph

D) Histogram

Correct Answer: C)

52. When presenting data in a bar chart, what does the length of each bar typically represent?

A) Frequency

B) Mean

C) Range

D) Category

Correct Answer: A)

53. According to Newton's first law of motion, an object at rest will remain at rest unless:

A) An unbalanced force acts on it

B) It is in space

C) It is on Earth

D) It is on a slope

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Correct Answer: A)

54. Newton's third law of motion states that for every action, there is an equal and opposite:

- A) Reaction
- B) Result
- C) Acceleration
- D) Inaction

Correct Answer: A)

55. Which numerical method is used to approximate the roots of an equation by successively improving the estimate?

- A) Bisection method
- B) Simpson's rule
- C) Trapezoidal rule
- D) Euler's method

Correct Answer: A)

56. Which numerical method is used to find the area under a curve by dividing it into smaller rectangles of equal width?

- A) Bisection method
- B) Gaussian quadrature
- C) Simpson's rule
- D) Riemann sum

Correct Answer: D)

57. What type of proof aims to show that a mathematical statement holds for all positive integers, starting from a base case and using an induction step?

- A) Proof by contradiction
- B) Proof by contrapositive
- C) Proof by mathematical induction
- D) Direct proof

Correct Answer: C)

58. In a proof by contradiction, if you assume the negation of the statement you want to prove and derive a contradiction, what can you conclude?

- A) The statement is true
- B) The statement is false
- C) Nothing can be concluded
- D) The proof is incomplete

Correct Answer: A)

59. What is the integral of the function $f(x) = 1/x$ with respect to x ?

- A) $\ln|x| + C$
- B) $\ln(x) + C$
- C) $1/\ln(x) + C$
- D) $e^x + C$

Correct Answer: B)

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60. If $\int (2x + 3x^2) dx = x^2 + x^3 + C$, what is the original function?

- A) $2x + 3x^2 + C$
- B) $x^2 + x^3 + 2$
- C) $x + 3x^3 + C$
- D) $2x^2 + 3x^3 + C$

Correct Answer: A)

61. What is the common ratio in the geometric sequence 3, 6, 12, 24, ...?

- A) 1
- B) 2
- C) 3
- D) 4

Correct Answer: B)

62. In an arithmetic sequence, if the first term (a) is 10 and the common difference (d) is 3, what is the seventh term?

- A) 13
- B) 19
- C) 25
- D) 31

Correct Answer: B)

63. What is the sum of the first 5 positive odd integers?

- A) 15
- B) 20
- C) 25
- D) 30

Correct Answer: A)

64. What is the sum of the infinite series $\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots$?

- A) 1
- B) 2
- C) $\frac{1}{2}$
- D) Infinity

Correct Answer: A)

65. What is the derivative of the function $f(x) = \sqrt{x^3 + 1}$ with respect to x?

- A) $\frac{3x^2}{2\sqrt{x^3 + 1}}$
- B) $\frac{2x^2}{\sqrt{x^3 + 1}}$
- C) $\sqrt{x^3 + 1}$
- D) $\frac{3x^2 + 1}{2\sqrt{x^3 + 1}}$

Correct Answer: A)

66. If $y = \ln(2x) - 3x^2$, what is the second derivative of y with respect to x?

- A) $-6x$
- B) $\frac{2}{x} - 6x$
- C) $\frac{2}{x^2} - 6$

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D) $\frac{2}{x} - 6$

Correct Answer: C)

67. What is the common ratio in the geometric sequence 3, 6, 12, 24, ...?

A) 1

B) 2

C) 3

D) 4

Correct Answer: B)

68. When you divide $(4a^2b - 8ab^2)$ by $4ab$, what is the simplified expression?

A) $a - 2b$

B) $a^2 - 2b^2$

C) $a - 2ab$

D) $a^2 - 2ab^2$

Correct Answer: A)

69. What is the result of dividing $(6x^3 - 12x^2 + 18x)$ by $6x$?

A) $x^2 - 2x + 3$

B) $x^2 - 2x$

C) $x^2 - 12x + 3$

D) $x^2 - 12x$

Correct Answer: A)

70. When you divide $(5a^3b^2 - 10a^2b^3)$ by $5ab^2$, what is the simplified expression?

A) $a^2 - 2b$

B) $a^2 - 2ab$

C) $a - 2b$

D) $a^2 - 2b^2$

Correct Answer: A)

Bachelors Math Past Paper

Bachelors Level Maths

1. What is the derivative of $f(x) = 3x^2 - 2x + 5$ with respect to x ?

- a) $6x - 2$
- b) $6x^2 - 2x$
- c) $2x^2 - 2$
- d) $3x - 1$

Answer: a)

2. In linear algebra, the determinant of a 2×2 matrix $[a, b; c, d]$ is calculated as:

- a) $ad - bc$
- b) $ab - cd$
- c) $ac - bd$
- d) $ad + bc$

Answer: a)

3. What is the square root of -9 in the complex numbers?

- a) $3i$
- b) $-3i$
- c) 3
- d) -3

Answer: b)

4. Which of the following is a prime number?

- a) 1
- b) 2
- c) 6
- d) 9

Answer: b)

5. In calculus, the integral of e^x with respect to x is:

- a) $\ln(x)$
- b) $x + C$
- c) e^x
- d) $1/x$

Answer: c)

6. What is the largest prime number less than 20?

- a) 17
- b) 18
- c) 19
- d) 20

Answer: a)

7. Which of the following is an irrational number?

- a) $\sqrt{4}$
- b) $\sqrt{9}$
- c) $\sqrt{2}$

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d) $\sqrt{16}$

Answer: c)

8. What is the sum of the first 10 natural numbers?

a) 45

b) 50

c) 55

d) 60

Answer: a)

9. Which mathematical concept describes the rate of change of one variable with respect to another at a specific point?

a) Slope

b) Area

c) Volume

d) Probability

Answer: a)

10. What is the value of π (pi) approximately equal to?

a) 3.14

b) 2.71

c) 1.61

d) 4.16

Answer: a)

11. What is the limit of the following sequence as n approaches infinity?

Limit as $n \rightarrow \infty$ $(n^2 + 3n) / (2n^3 - n^2 + 5)$

a) 0

b) $1/2$

c) 1

d) ∞

Answer: a)

12. Which of the following is a non-abelian group?

a) The group of invertible 2×2 matrices

b) The group of integers under addition

c) The group of real numbers under multiplication

d) The group of rational numbers under addition

Answer: a)

13. In complex analysis, what is the residue of the function $f(z) = e^{1/z}$ at the point $z = 0$?

a) 0

b) 1

c) -1

d) Does not exist

Answer: d)

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14. Which of the following statements is true for a compact metric space?

- a) It is always connected
- b) It is always uncountable
- c) It is complete and totally bounded
- d) It is homeomorphic to the unit interval $[0, 1]$

Answer: c)

15. What is the Galois group of the polynomial $x^3 - 2$ over the rational numbers $\mathbb{Q}$?

- a) $\mathbb{Z}/3\mathbb{Z}$
- b) S_3 (symmetric group on 3 elements)
- c) D_3 (dihedral group of order 6)
- d) $\mathbb{Q}(\sqrt{2}, \sqrt[3]{2})$

Answer: b)

16. Which of the following series is not absolutely convergent?

- a) $\sum (1/n^2)$, n from 1 to ∞
- b) $\sum (1/n)$, n from 1 to ∞
- c) $\sum ((-1)^{n/n})$, n from 1 to ∞
- d) $\sum (1/n!)$, n from 1 to ∞

Answer: c)

17. In number theory, what is the smallest positive integer that is both a square and a cube?

- a) 0
- b) 1
- c) 8
- d) 64

Answer: b)

18. What is the dimension of the vector space of all 3×3 skew-symmetric matrices over the real numbers?

- a) 3
- b) 6
- c) 9
- d) 0

Answer: b)

19. Which of the following is a transcendental number?

- a) π (pi)
- b) e (Euler's number)
- c) $\sqrt{2}$ (square root of 2)
- d) ϕ (golden ratio)

Answer: b)

20. What is the Laplace transform of the unit step function $u(t)$?

- a) $1/s$
- b) $1/s^2$

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c) $1/(s-1)$

d) 1

Answer: a)

21. In abstract algebra, what is the order of the cyclic group generated by a single element a , where $a^4 = e$ (the identity element)?

a) 2

b) 4

c) 8

d) 16

Answer: b)

22. What is the area enclosed by the curve $y = e^x$, the x-axis, and the lines $x = 0$ and $x = 1$?

a) $1 - e$

b) $e - 1$

c) $e + 1$

d) $1 + e$

Answer: a)

23. In complex analysis, what is the residue of the function $f(z) = 1/z^2$ at the point $z = 0$?

a) 0

b) 1

c) -1

d) Does not exist

Answer: b)

24. Which of the following is not a Hilbert space?

a) $L^2[0, 1]$ (space of square-integrable functions on $[0, 1]$)

b) $\mathbb{R}^2$ (Euclidean space)

c) $C[0, 1]$ (space of continuous functions on $[0, 1]$)

d) P_2 (space of polynomials of degree at most 2)

Answer: b)

25. What is the rank of the matrix $A =$

$\begin{vmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \\ 0 & 0 & 3 \end{vmatrix}$

a) 3

b) 2

c) 1

d) 0

Answer: a)

26. How many prime numbers are there between 1 and 100?

a) 24

b) 25

c) 26

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d) 27

Answer: b)

27. In topology, what is the boundary of the open interval $(0, 1)$ in the real line?

a) $\{0, 1\}$

b) $[0, 1]$

c) $(0, 1)$

d) $[0, 1) \cup (0, 1]$

Answer: a)

28. Which of the following is a fundamental theorem in number theory that states every integer greater than 1 is either prime or can be uniquely factorized into primes?

a) Fermat's Little Theorem

b) Euler's Theorem

c) Fundamental Theorem of Calculus

d) Fundamental Theorem of Arithmetic

Answer: d)

29. What is the derivative of the function $f(x) = e^{(2x)} * \sin(x)$?

a) $2e^{(2x)} * \cos(x)$

b) $e^{(2x)} * \cos(x)$

c) $e^{(2x)} * \sin(x)$

d) $2e^{(2x)} * \sin(x)$

Answer: a)

30. Which of the following is a first-order linear homogeneous differential equation?

a) $dy/dx = x^2y$

b) $dy/dx = y/x$

c) $d^2y/dx^2 + xy = 0$

d) $d^2y/dx^2 + y = 0$

Answer: b)

31. In probability theory, what is the expected value of a discrete random variable X with probability mass function $P(X = x)$ as follows:

$P(X = 1) = 1/4$

$P(X = 2) = 1/2$

$P(X = 3) = 1/4$

a) 1

b) 2

c) 1.5

d) $3/2$

Answer: c)

32. What is the integral of the function $\int (2x^2 - 3x + 1) dx$?

a) $(2/3)x^3 - (3/2)x^2 + x + C$

b) $x^3 - (3/2)x^2 + x + C$

c) $(2/3)x^3 - (3/2)x^2 + C$

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d) $x^3 - (3/2)x^2 + C$

Answer: a)

33. What is the Laplace transform of the function $f(t) = t^2$?

a) $2/s^2$

b) $2/s^3$

c) $2/s$

d) $2/s^4$

Answer: b)

34. Which of the following is an example of a separable first-order differential equation?

a) $dy/dx = x^2 + y$

b) $dy/dx = x + y^2$

c) $dy/dx = y/x$

d) $dy/dx = x/y$

Answer: c)

35. In probability theory, the variance of a random variable measures:

a) How spread out the values of the random variable are.

b) The likelihood of a specific outcome.

c) The expected value of the random variable.

d) The probability of the random variable being zero.

Answer: a)

36. What is the Taylor series expansion of the function $f(x) = \sin(x)$ centered at $x = 0$?

a) $x - x^3/3! + x^5/5! - x^7/7! + \dots$

b) $1 - x^2/2! + x^4/4! - x^6/6! + \dots$

c) $1 + x + x^2/2! + x^3/3! + \dots$

d) $x^2 - x^4/2! + x^6/4! - x^8/6! + \dots$

Answer: a)

37. Which of the following is an exact differential equation?

a) $(x^2 + y^2)dx + 2xydy = 0$

b) $(y^2 + 2xy)dx + (x^2 - 2xy)dy = 0$

c) $x^2dx - y^2dy = 0$

d) $(y^2 + 2xy)dx + (x^2 + 2xy)dy = 0$

Answer: a)

38. In probability theory, what is the complement of an event A?

a) The intersection of event A with its complement.

b) The union of event A with its complement.

c) The set of outcomes that are not in event A.

d) The set of outcomes that are in both event A and its complement.

Answer: c)

39. What is the dimension of a line in Euclidean space?

a) 0

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- b) 1
- c) 2
- d) 3

Answer: b)

40. In algebraic geometry, what is an algebraic variety?

- a) A variety of algebraic expressions
- b) A set of points defined by polynomial equations
- c) A complex number
- d) A set of irrational numbers

Answer: b)

41. What is the first law of motion, according to Newton?

- a) An object in motion tends to stay in motion
- b) The force applied to an object is equal to its acceleration
- c) Every object persists in its state of rest or uniform motion unless acted upon by an external force
- d) For every action, there is an equal and opposite reaction

Answer: c)

42. Which law of thermodynamics states that energy cannot be created or destroyed, only transferred or converted from one form to another?

- a) Zeroth law
- b) First law
- c) Second law
- d) Third law

Answer: b)

43. In quantum mechanics, what is a photon?

- a) A particle with mass
- b) A subatomic particle
- c) A discrete packet of electromagnetic radiation
- d) A type of quark

Answer: c)

44. Which fundamental force of nature is responsible for holding the nucleus of an atom together?

- a) Electromagnetic force
- b) Gravitational force
- c) Strong nuclear force
- d) Weak nuclear force

Answer: c)

45. Who formulated the theory of general relativity?

- a) Isaac Newton
- b) Albert Einstein
- c) Max Planck

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d) Werner Heisenberg

Answer: b)

46. General relativity is a theory of:

a) Electromagnetism

b) Gravity

c) Quantum mechanics

d) Special relativity

Answer: b)

47. What is the sum of the interior angles of a triangle in Euclidean geometry?

a) 90 degrees

b) 120 degrees

c) 180 degrees

d) 360 degrees

Answer: c)

48. Which branch of mathematics studies the shapes, sizes, properties, and dimensions of objects?

a) Algebra

b) Geometry

c) Calculus

d) Statistics

Answer: b)

49. What is a common mathematical model used to describe the growth of a population over time?

a) Linear regression

b) Exponential growth

c) Quadratic equation

d) Logarithmic decay

Answer: b)

50. Which mathematical concept is often used to model the spread of diseases in a population?

a) Linear equations

b) Differential equations

c) Geometry

d) Number theory

Answer: b)

51. Which famous Greek mathematician and philosopher is considered the father of geometry?

a) Euclid

b) Pythagoras

c) Archimedes

d) Aristotle

Answer: a)

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52. Who is known for the philosophical statement "I think, therefore I am"?

- a) Immanuel Kant
- b) René Descartes
- c) Friedrich Nietzsche
- d) Socrates

Answer: b)

53. What is the gradient of a scalar function in multivariate calculus?

- a) A vector that points in the direction of greatest increase of the function
- b) The second derivative of the function
- c) The curl of the function
- d) A scalar quantity

Answer: a)

54. Which mathematical model is often used to describe the spread of information or rumors in a social network?

- a) Linear regression
- b) Logistic growth
- c) Diffusion equation
- d) Game theory

Answer: c)

55. What is the expected value (mean) of a fair six-sided die?

- a) 1
- b) 3.5
- c) 4
- d) 6

Answer: b)

56. In algebraic geometry, what is a Riemann surface?

- a) A two-dimensional complex manifold
- b) A smooth algebraic curve
- c) A three-dimensional manifold
- d) A topological space

Answer: a)

57. In differential geometry, what is the Levi-Civita connection?

- a) A connection between two differentiable manifolds
- b) A connection on a Riemannian manifold that preserves the metric
- c) A differential equation
- d) A type of algebraic structure

Answer: b)

58. Which theorem in classical mechanics states that the total energy of an isolated system is conserved over time?

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- a) Hamilton's principle
- b) Noether's theorem
- c) The law of conservation of energy
- d) Lagrange's equation

Answer: c)

59. In classical mechanics, what is the Lagrangian of a system?

- a) A measure of kinetic energy
- b) A function that describes the dynamics of a system
- c) The action of a system
- d) The potential energy of a system

Answer: b)

60. In quantum mechanics, what is the wave function Ψ used to describe?

- a) The probability density of finding a particle
- b) The energy of a particle
- c) The velocity of a particle
- d) The angular momentum of a particle

Answer: a)

61. What is the Navier-Stokes equation used for in fluid dynamics?

- a) Describing the behavior of electromagnetic waves in a medium
- b) Predicting the behavior of compressible fluids
- c) Modeling the motion of incompressible fluids
- d) Analyzing quantum fluid dynamics

Answer: c)

62. In general relativity, what is a geodesic?

- a) A straight line in flat spacetime
- b) A mathematical surface
- c) A curved path that objects follow under gravity
- d) A type of black hole

Answer: c)

63. What is the Schwarzschild radius associated with in general relativity?

- a) The event horizon of a black hole
- b) The curvature of spacetime
- c) The cosmological constant
- d) The mass of a star

Answer: a)

64. What is the Euler characteristic of a surface?

- a) The total number of edges on the surface
- b) The total number of vertices on the surface
- c) A topological invariant that characterizes the surface
- d) The curvature of the surface

Answer: c)

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65. In dynamical systems theory, what is the Poincaré map used for?

- a) Calculating the energy of a system
- b) Describing chaotic behavior in systems
- c) Modeling celestial mechanics
- d) Analyzing the periodic behavior of a system

Answer: d)

66. What is a Turing pattern in mathematical biology?

- a) A mathematical model of population growth
- b) A spatial pattern that emerges due to diffusion and reaction
- c) A type of cellular automaton
- d) A pattern in the Fibonacci sequence

Answer: b)

67. In epidemiology modeling, what does the basic reproduction number (R_0) represent?

- a) The total number of infected individuals in an outbreak
- b) The average number of secondary cases generated by one infected individual
- c) The rate of vaccination
- d) The average duration of illness

Answer: b)

68. What is Gödel's incompleteness theorem in mathematical philosophy?

- a) It states that all mathematical statements can be proven or disproven.
- b) It shows that there are inherent limits to what can be proven in formal systems.
- c) It demonstrates a method for solving undecidable problems.
- d) It provides a complete axiomatic foundation for mathematics.

Answer: b)

69. Who is known for introducing the concept of the "infinite regress" in philosophical arguments?

- a) Aristotle
- b) Plato
- c) Immanuel Kant
- d) Thomas Aquinas

Answer: a)

70. In multivariate calculus, what is the Hessian matrix used to determine?

- a) Second-order partial derivatives of a function
- b) Eigenvalues of a matrix
- c) Linear transformations
- d) Taylor series expansions

Answer: a)

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Masters Level Maths

1. In mathematical modeling, what is the Lotka-Volterra model used to describe?

- a) Population growth
- b) Fluid dynamics
- c) Chemical reactions
- d) Predator-prey interactions

Answer: d)

2. In probability theory, what is the law of large numbers (LLN) about?

- a) It describes the likelihood of rare events occurring.
- b) It provides a method for calculating conditional probabilities.
- c) It states that as the number of trials increases, the sample mean approaches the population mean.
- d) It explains the concept of Bayes' theorem.

Answer: c)

3. What is the Kolmogorov-Smirnov test used for in statistics?

- a) Testing for normality of a dataset
- b) Determining the mean of a dataset
- c) Estimating the standard deviation of a dataset
- d) Conducting hypothesis tests

Answer: a)

4. In machine learning, what is the curse of dimensionality?

- a) A phenomenon where the performance of algorithms degrades as the dimensionality of the data increases
- b) A way to deal with high-dimensional data
- c) A method for dimensionality reduction
- d) A technique for data augmentation

Answer: a)

5. What is the primary objective of feature selection in machine learning?

- a) To increase the dimensionality of the data
- b) To reduce the number of observations in the dataset
- c) To identify the most relevant features for modeling
- d) To create synthetic features

Answer: c)

6. What is the largest prime factor of 407?

- a) 11
- b) 37
- c) 47
- d) 97

Answer: b)

7. How many positive integer divisors does 720 have?

- a) 12
- b) 16
- c) 24
- d) 30

Answer: c)

Masters Math Past Paper

8. When applying the bisection method to find a root of $f(x) = x^3 - 5x - 9$, what is the midpoint after the first iteration if the initial interval is $[2, 3]$?

- a) 2.25
- b) 2.5
- c) 2.75
- d) 2.875

Answer: a)

9. What is the result of Simpson's $1/3$ rule applied to the integral of $f(x) = e^x$ from 0 to 2 with four subintervals?

- a) 6.74
- b) 6.84
- c) 7.02
- d) 7.12

Answer: b)

10. In string theory, what is the fundamental unit of length, often denoted as l_s ?

- a) Planck length
- b) Fermi
- c) Bohr radius
- d) Parsec

Answer: a)

11. How many dimensions are typically required for the formulation of superstring theory?

- a) 3
- b) 4
- c) 10
- d) 26

Answer: c)

12. What is the expected eigenvalue distribution of a random Hermitian matrix in the Gaussian Unitary Ensemble (GUE)?

- a) Uniform distribution
- b) Normal distribution
- c) Poisson distribution
- d) Wigner semi-circle distribution

Answer: d)

13. How many independent entries are in a 4×4 random orthogonal matrix?

- a) 6
- b) 8
- c) 10
- d) 12

Answer: a)

14. In a simple undirected graph with 10 vertices, what is the maximum number of edges that can exist?

- a) 20
- b) 25
- c) 30
- d) 45

Answer: a)

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15. In a complete bipartite graph $K_{(m,n)}$, where m and n are positive integers, how many edges are there?

- a) mn
- b) $m + n$
- c) $(m + n)^2$
- d) $m * n / 2$

Answer: a)

16. What is the expectation value of the position operator in a one-dimensional quantum harmonic oscillator ground state?

- a) 0
- b) $\hbar/2$
- c) $\hbar$
- d) $2\hbar$

Answer: a)

17. In a two-particle quantum system, what is the total number of quantum numbers needed to describe both particles completely if they are distinguishable?

- a) 1
- b) 2
- c) 3
- d) 4

Answer: b)

18. What is the Mean Absolute Error (MAE) for a forecasting model if the actual values are [10, 15, 12] and the predicted values are [12, 18, 14]?

- a) 2
- b) 2.33
- c) 2.67
- d) 3

Answer: b)

19. If the forecast error of a model follows a normal distribution with a mean of 0 and a standard deviation of 3, what is the 95% prediction interval for a single forecast?

- a) (-3, 3)
- b) (-6, 6)
- c) (-9, 9)
- d) (-12, 12)

Answer: b)

20. In matroid theory, what is the rank of a matroid?

- a) The number of elements in the ground set
- b) The maximum size of any independent set
- c) The minimum size of any base set
- d) The number of circuits in the matroid

Answer: b)

21. What is the dual matroid of a uniform matroid of rank r on a set of n elements?

- a) The uniform matroid of rank $n - r$ on the same set
- b) The same matroid
- c) The empty set matroid
- d) The complete graph matroid

Answer: a)

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22. In control theory, what does the Laplace transform of a system's transfer function provide?
- a) The system's time response
 - b) The system's state-space representation
 - c) The system's frequency response
 - d) The system's feedback gain
- Answer: c)

23. What is the order of a control system characterized by the transfer function $G(s) = (s + 1)/(s^2 + 3s + 2)$?
- a) 1
 - b) 2
 - c) 3
 - d) 4
- Answer: b)

24. What is the smallest positive integer n for which $\phi(n) = 40$, where $\phi(n)$ is Euler's totient function?
- a) 41
 - b) 48
 - c) 49
 - d) 50
- Answer: b)

25. In modular arithmetic, what is the modular multiplicative inverse of 7 (mod 11)?
- a) 3
 - b) 7
 - c) 8
 - d) 10
- Answer: c)

26. What is the result of Euler's method applied to the differential equation $y' = 2x$ with $y(0) = 1$ and a step size of 0.5 at $x = 2$?
- a) 2.5
 - b) 3
 - c) 4
 - d) 5
- Answer: c)

27. When applying Newton-Raphson method to find a root of $f(x) = x^3 - 5x - 9$, what is the approximate value of the root after the first iteration if the initial guess is $x = 3$?
- a) 2.1
 - b) 2.4
 - c) 2.6
 - d) 2.8
- Answer: b)

28. Which type of string theory is known for incorporating supersymmetry and extra dimensions, including 11 dimensions in total?
- a) Type 0
 - b) Type I
 - c) Type IIA
 - d) Type IIB
- Answer: c)

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29. In string theory, what is the characteristic of a D-brane?

- a) A one-dimensional object
- b) A zero-dimensional point
- c) A higher-dimensional surface on which open strings can end
- d) A closed string configuration

Answer: c)

30. What is the expected eigenvalue distribution of a random unitary matrix in the Circular Unitary Ensemble (CUE)?

- a) Uniform distribution
- b) Normal distribution
- c) Semicircle distribution
- d) Wigner surmise distribution

Answer: c)

31. What is the expected eigenvalue distribution of a random real symmetric matrix in the Gaussian Orthogonal Ensemble (GOE)?

- a) Uniform distribution
- b) Normal distribution
- c) Semicircle distribution
- d) Wigner surmise distribution

Answer: d)

32. In graph theory, what is the maximum number of edges in a simple graph with 7 vertices?

- a) 20
- b) 21
- c) 28
- d) 35

Answer: c)

33. How many edges does a complete graph K_n have, where n is the number of vertices?

- a) $n(n-1)/2$
- b) $n(n+1)/2$
- c) $2n$
- d) n^2

Answer: a)

34. What is the commutation relation between position (x) and momentum (p) operators in quantum mechanics?

- a) $[x, p] = 0$
- b) $[x, p] = i$
- c) $[x, p] = \hbar$
- d) $[x, p] = -i\hbar$

Answer: b)

35. In quantum mechanics, what is the probability of finding a particle in an energy eigenstate with energy E in a one-dimensional infinite potential well?

- a) 1
- b) 0
- c) $1/2$
- d) E

Answer: b)

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36. What is the root mean square error (RMSE) for a forecasting model if the actual values are [12, 15, 10] and the predicted values are [10, 12, 11]?

- a) 1
- b) 1.41
- c) 2
- d) 3

Answer: b)

37. In time series forecasting, what is the autocorrelation function (ACF) used to measure?

- a) The power spectrum of a time series
- b) The dependence of a time series on its past values
- c) The forecast error
- d) The seasonality of a time series

Answer: b)

38. What is the chromatic number of a matroid?

- a) The size of the ground set
- b) The rank of the matroid
- c) The maximum size of an independent set
- d) The minimum size of a dependent set

Answer: c)

39. What is the minimum size of a base set in a uniform matroid of rank r on a set of n elements?

- a) r
- b) $n - r$
- c) $r + 1$
- d) $n - r + 1$

Answer: b)

40. In control theory, what does the Laplace transform of a system's transfer function provide?

- a) The system's time response
- b) The system's state-space representation
- c) The system's frequency response
- d) The system's transfer function

Answer: c)

41. What is the order of a control system characterized by the transfer function $G(s) = (s + 2)/(s^3 + 3s^2 + 4s + 2)$?

- a) 1
- b) 2
- c) 3
- d) 4

Answer: c)

42. What is the main principle governing the movement of gases across biological membranes in the human body?

- a) Fick's law
- b) Darcy's law
- c) Hooke's law
- d) Newton's law

Answer: a)

43. Which of the following best describes the study of biomechanics?

- a) The application of statistics in medical research

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- b) The study of how living organisms move and interact with their environment
 - c) The development of new medical imaging techniques
 - d) The study of genetic engineering
- Answer: b)

44. What is the primary goal of evidence-based medicine?

- a) To provide medical care without any scientific basis
 - b) To rely solely on clinical experience and intuition
 - c) To make medical decisions based on the best available scientific evidence
 - d) To ignore scientific research in clinical practice
- Answer: c)

45. In evidence-based medicine, what does "RCT" stand for?

- a) Randomized Clinical Trial
 - b) Rapid Clinical Testing
 - c) Real-world Clinical Treatment
 - d) Randomized Comparative Test
- Answer: a)

46. What is the Reynolds number used to predict in fluid dynamics?

- a) The pressure drop in a fluid
 - b) The heat transfer in a fluid
 - c) The onset of turbulence in a fluid flow
 - d) The density of a fluid
- Answer: c)

47. What is the Navier-Stokes equation used to describe in fluid dynamics?

- a) The behavior of electromagnetic waves in a fluid
 - b) The motion of incompressible fluids
 - c) The heat transfer in fluids
 - d) The behavior of compressible gases
- Answer: b)

48. What is the present value of \$1,000 to be received in 5 years with an annual discount rate of 6%?

- a) \$747.26
 - b) \$747.74
 - c) \$835.49
 - d) \$849.33
- Answer: a)

49. What is the concept of diversification in financial portfolio management?

- a) Investing in a single asset to maximize returns
 - b) Reducing risk by investing in a variety of assets
 - c) Focusing on short-term investments for quick gains
 - d) Ignoring asset allocation in investment strategies
- Answer: b)

50. In machine learning, what is the term "overfitting" referring to?

- a) Creating a model that is too simple to capture the data's complexities
 - b) Creating a model that accurately generalizes to new, unseen data
 - c) Creating a model that fits the training data too closely, but fails to generalize well
 - d) Creating a model that doesn't fit the training data at all
- Answer: c)

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51. What is the primary goal of unsupervised learning in machine learning?

- a) To make predictions based on labeled data
- b) To learn patterns and structures in data without explicit labels
- c) To optimize a model's hyperparameters
- d) To classify data into predefined categories

Answer: b)

52. What is the objective in linear programming?

- a) Minimizing the number of variables
- b) Minimizing a linear objective function subject to linear constraints
- c) Minimizing the complexity of the optimization problem
- d) Maximizing the number of constraints

Answer: b)

53. What does the term "convex optimization" refer to in optimization theory?

- a) The process of maximizing non-linear functions
- b) The study of non-convex functions
- c) Optimization problems where the objective function is convex
- d) The process of solving differential equations

Answer: c)

54. Calculate the flow rate (Q) of a liquid with a velocity of 2 m/s and a cross-sectional area of 0.02 m².

- a) 0.04 m³/s
- b) 0.2 m³/s
- c) 4 m³/s
- d) 40 m³/s

Answer: b)

55. A blood vessel has a radius of 0.5 mm. Calculate the flow velocity of blood in this vessel if the flow rate is 1.5 cm³/s.

- a) 3 cm/s
- b) 30 cm/s
- c) 300 cm/s
- d) 3000 cm/s

Answer: a)

56. Calculate the Reynolds number for a fluid with a density of 1000 kg/m³, a velocity of 2 m/s, a characteristic length of 0.1 m, and a dynamic viscosity of 0.001 Pa·s.

- a) 20
- b) 200
- c) 2000
- d) 20000

Answer: c)

57. The pressure difference across a pipe is 5000 Pa, and the flow rate is 0.01 m³/s. Calculate the resistance (R) of the pipe.

- a) 500 Pa·s/m³
- b) 5000 Pa·s/m³
- c) 50000 Pa·s/m³
- d) 500000 Pa·s/m³

Answer: b)

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58. Calculate the future value (FV) of \$5000 invested at an annual interest rate of 6% for 3 years, compounded annually.

- a) \$5,500
- b) \$5,940
- c) \$5,940.12
- d) \$6,000

Answer: c)

59. If an investment doubles in value in 10 years, what is the annual compound interest rate it is earning?

- a) 5%
- b) 6%
- c) 7%
- d) 10%

Answer: a)

60. Calculate the mean absolute error (MAE) for a regression model with the following actual and predicted values:

Actual: [12, 15, 10]

Predicted: [10, 12, 11]

- a) 0.67
- b) 1.00
- c) 1.33
- d) 2.00

Answer: b)

61. If a binary classification model correctly identifies 85 out of 100 positive cases and 90 out of 100 negative cases, calculate the accuracy of the model.

- a) 85%
- b) 90%
- c) 87.5%
- d) 89.5%

Answer: c)

62. Calculate the solution to the linear programming problem:

Maximize $3x + 2y$

Subject to:

$$x + y \leq 6$$

$$2x + 3y \leq 12$$

$$x, y \geq 0$$

a) $x = 2, y = 4, \text{Max} = 14$

b) $x = 3, y = 3, \text{Max} = 13$

c) $x = 4, y = 2, \text{Max} = 12$

d) $x = 6, y = 0, \text{Max} = 11$

Answer: a)

63. Calculate the value of the objective function for the integer programming problem:

Maximize $4x + 3y$

Subject to:

$$x + 2y \leq 7$$

$$3x + y \leq 8$$

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x, y are integers

- a) 14
- b) 13
- c) 12
- d) 11

Answer: b)

64. What is the Euler characteristic of a surface?

- a) The total number of edges on the surface
- b) The total number of vertices on the surface
- c) A topological invariant that characterizes the surface
- d) The curvature of the surface

Answer: c)

65. In dynamical systems theory, what is the Poincaré map used for?

- a) Calculating the energy of a system
- b) Describing chaotic behavior in systems
- c) Modeling celestial mechanics
- d) Analyzing the periodic behavior of a system

Answer: d)

66. What is a Turing pattern in mathematical biology?

- a) A mathematical model of population growth
- b) A spatial pattern that emerges due to diffusion and reaction
- c) A type of cellular automaton
- d) A pattern in the Fibonacci sequence

Answer: b)

67. In epidemiology modeling, what does the basic reproduction number (R_0) represent?

- a) The total number of infected individuals in an outbreak
- b) The average number of secondary cases generated by one infected individual
- c) The rate of vaccination
- d) The average duration of illness

Answer: b)

68. What is Gödel's incompleteness theorem in mathematical philosophy?

- a) It states that all mathematical statements can be proven or disproven.
- b) It shows that there are inherent limits to what can be proven in formal systems.
- c) It demonstrates a method for solving undecidable problems.
- d) It provides a complete axiomatic foundation for mathematics.

Answer: b)

69. Who is known for introducing the concept of the "infinite regress" in philosophical arguments?

- a) Aristotle
- b) Plato
- c) Immanuel Kant
- d) Thomas Aquinas

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Answer: a)

70. In multivariate calculus, what is the Hessian matrix used to determine?

- a) Second-order partial derivatives of a function
- b) Eigenvalues of a matrix
- c) Linear transformations
- d) Taylor series expansions

Answer: a)