

Mathematics
Sample Question Paper – 6
Class IX (Ganita Manjari)

Time allowed: 3 hours

Maximum Marks: 80

General Instructions:

- (1) This question paper contains 38 questions. All questions are compulsory.
 - (2) The paper is divided into five Sections - A, B, C, D and E.
 - (3) Section A: Questions 1-18 are MCQs and Questions 19-20 are Assertion-Reason questions of 1 mark each.
 - (4) Section B: Questions 21-25 are Very Short Answer questions carrying 2 marks each.
 - (5) Section C: Questions 26-31 are Short Answer questions carrying 3 marks each.
 - (6) Section D: Questions 32-35 are Long Answer questions carrying 5 marks each.
 - (7) Section E: Questions 36-38 are case study based questions carrying 4 marks each.
 - (8) There is no overall choice. Internal choice is provided in 2 questions in Section B, 2 in Section C, 2 in Section D and in the 2-mark part of each case study.
 - (9) Use $\pi = 22/7$ wherever required unless stated otherwise. Calculators are not allowed.
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SECTION A

(Questions 1 to 20 carry 1 mark each. $20 \times 1 = 20$)

1. The distance of the point $(-7, 4)$ from the y-axis is:
(A) 4 units (B) 7 units
(C) 11 units (D) $\sqrt{65}$ units
2. If M(2, -1) is the midpoint of A(-4, 3) and B(x, y), then x equals:
(A) 4 (B) 6
(C) 8 (D) 10
3. Which linear polynomial has zero 6?
(A) $x + 6$ (B) $2x - 12$
(C) $3x + 18$ (D) $6x + 1$
4. If $y = -3x + 8$, the value of y when $x = -2$ is:
(A) 2 (B) 6
(C) 14 (D) -14
5. Which lies between $\sqrt{8}$ and $\sqrt{10}$?
(A) 2.5 (B) 3
(C) 3.5 (D) 4
6. The product of a non-zero rational number and an irrational number is:
(A) always rational
(B) always irrational
(C) always integer
(D) sometimes natural only

7. The area model shown represents the product:

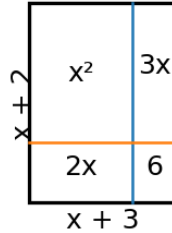


Figure for Question 7

(A) $(x + 2)(x + 3)$

(B) $(x - 2)(x + 3)$

(C) $(x + 6)(x + 1)$

(D) $x(x + 5)$

8. $x^3 - 8$ is equal to:

(A) $(x - 2)(x^2 + 2x + 4)$

(B) $(x + 2)(x^2 - 2x + 4)$

(C) $(x - 2)^3$

(D) $(x - 8)(x^2 + 1)$

9. A chord of a circle equal to its diameter subtends at the centre an angle of:

(A) 60°

(B) 90°

(C) 120°

(D) 180°

10. If $\angle AOC = 160^\circ$ and B is a point on the remaining arc AC, then $\angle ABC$ is:

(A) 40°

(B) 80°

(C) 100°

(D) 160°

11. The semi-perimeter of a triangle with sides 9 cm, 12 cm and 15 cm is:

(A) 18 cm

(B) 24 cm

(C) 36 cm

(D) 54 cm

12. The area of a semicircle of radius 14 cm is:

(A) 154 cm^2

(B) 308 cm^2

(C) 616 cm^2

(D) 1232 cm^2

13. A bag contains 6 white and 4 black counters. Probability of not drawing a black counter is:

(A) $2/5$

(B) $3/5$

(C) $4/5$

(D) $1/2$

14. If an event occurs 36 times in 90 trials, its relative frequency is:

(A) $2/5$

(B) $3/5$

(C) $4/9$

(D) $5/9$

15. The common difference of the AP 31, 25, 19, 13, ... is:

(A) 6

(B) -6

(C) -12

(D) 18

16. The bar pattern shown gives the numbers 3, 6, 9, 12, The height at Stage n is:

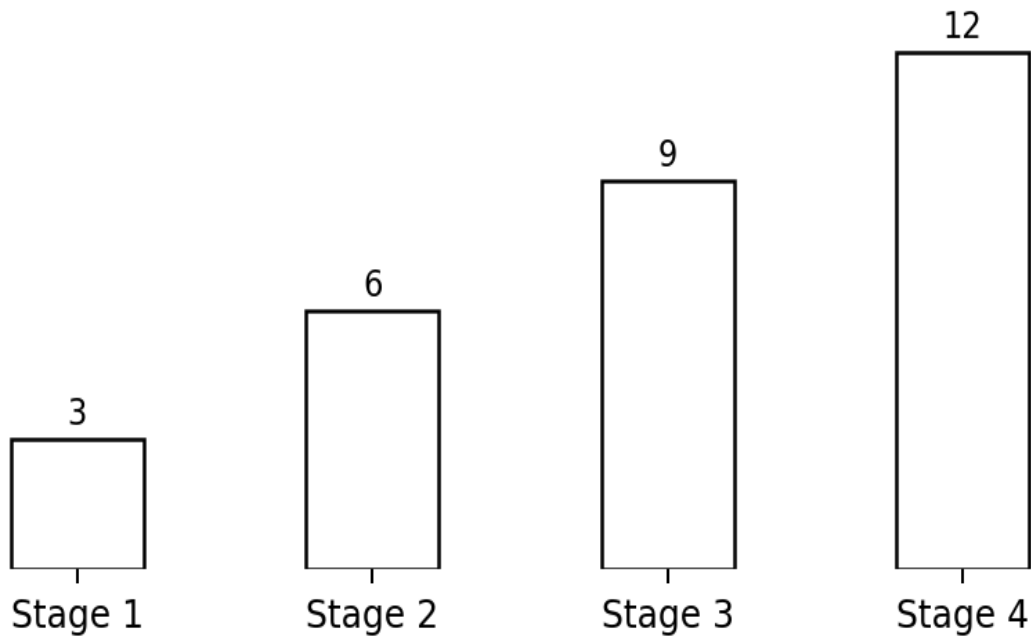


Figure for Question 16

- (A) $n + 3$
- (B) $2n + 1$
- (C) $3n$
- (D) $3n - 1$

17. The 7th term of the GP 2, -6, 18, -54, ... is:

- (A) 486
- (B) - 486
- (C) 1458
- (D) - 1458

18. The 15th triangular number is:

- (A) 105
- (B) 120
- (C) 225
- (D) 240

Questions 19 and 20 are Assertion-Reason based. Choose:

- (A) Both A and R are true and R correctly explains A.
- (B) Both A and R are true but R does not correctly explain A.
- (C) A is true but R is false.
- (D) A is false but R is true.

19. Assertion (A): The graph of $y = 4x + 1$ and $y = 4x - 5$ are parallel.

Reason (R): Both lines have the same coefficient of x .

20. Assertion (A): A diameter is the longest chord of a circle.

Reason (R): A chord nearer the centre is longer than a chord farther from the centre.

SECTION B

(Questions 21 to 25 carry 2 marks each. $5 \times 2 = 10$)

21. In the coordinate figure, $A(-4, 1)$, $B(2, 1)$ and $C(2, 5)$. Find AB and BC and hence identify the type of angle at B .

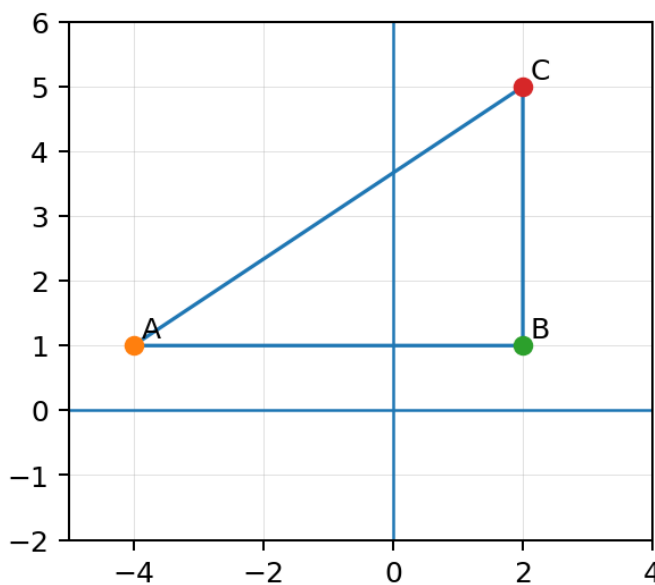


Figure for Question 21

22. (a) Find two irrational numbers between 3 and 4.

OR

(b) Write $0.181818\dots$ in the form p/q .

23. Factorise completely: $9a^2 - 25b^2$.

24. In the figure, two chords AB and CD are at distances 4 cm and 6 cm respectively from the centre O . Which chord is longer? State the theorem used.

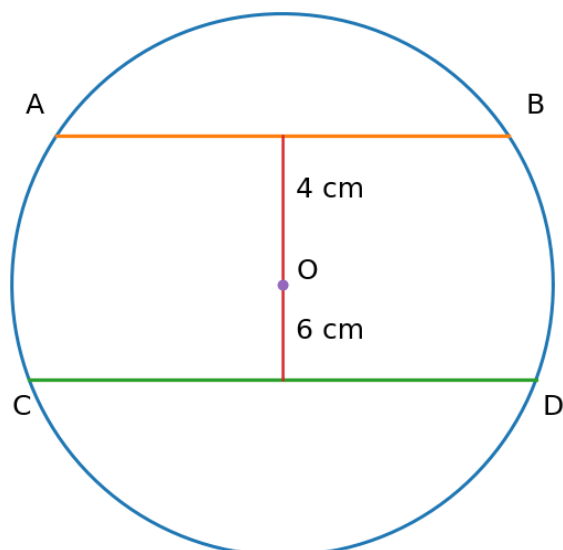


Figure for Question 24

25. (a) Find the 24th term of the AP 18, 13, 8, 3,

OR

(b) A GP begins 243, 81, 27, Write its next three terms.

SECTION C

(Questions 26 to 31 carry 3 marks each. $6 \times 3 = 18$)

26. The linear polynomial $p(x) = ax + 5$ satisfies $p(4) = 17$. Find a , write $p(x)$ and find its zero.

27. (a) Using identities, evaluate 1003×997 .

OR

(b) Factorise $x^2 - 4x - 45$ and verify the result.

28. The point P representing $\sqrt{10}$ is shown on the number line. State between which integers $\sqrt{10}$ lies. Describe a geometrical construction using a right triangle to locate $\sqrt{10}$ on a number line.

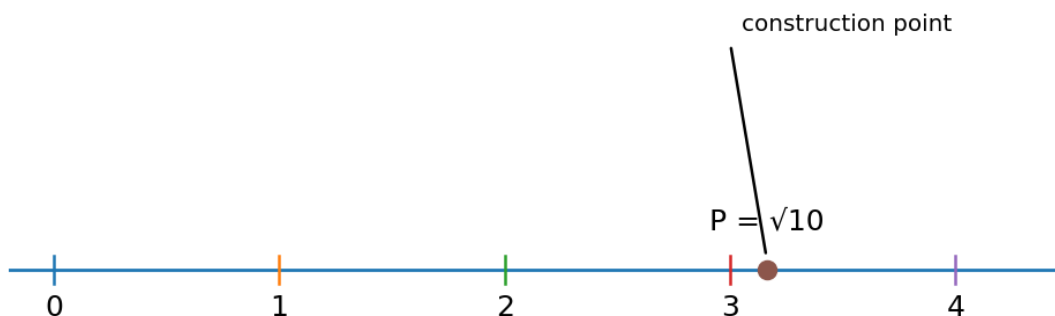


Figure for Question 28

29. A triangle has sides 13 cm, 13 cm and 10 cm. Find its area using Heron's formula.

30. In the circle, $\angle AOB = 120^\circ$. Find $\angle ACB$ and state the theorem used.

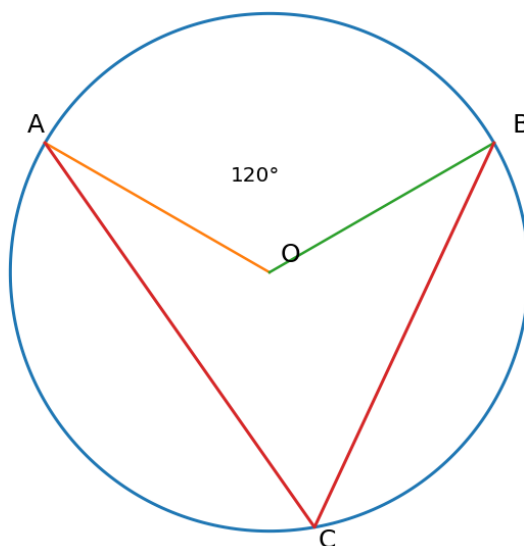


Figure for Question 30

31. (a) Two coins are tossed simultaneously. Write the sample space and find the probability of getting at most one head.

OR

(b) A card is chosen from cards numbered 1 to 20. Find the probability that it is divisible by 4 or 5.

SECTION D

(Questions 32 to 35 carry 5 marks each. $4 \times 5 = 20$)

32. The first four triangular-number arrangements are shown.

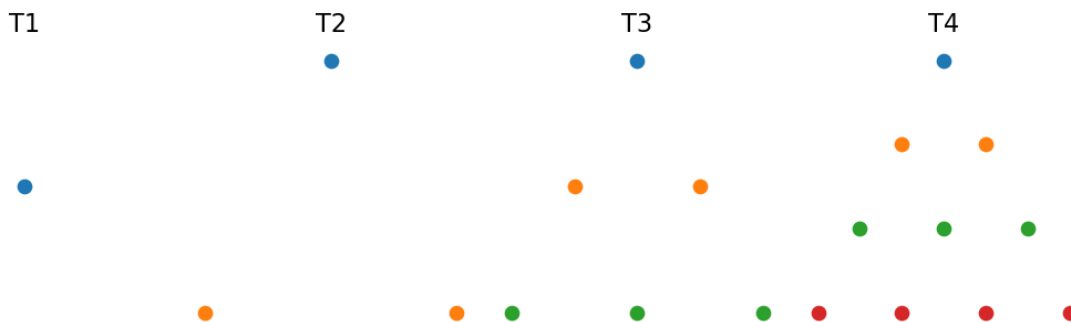


Figure for Question 32

- Write the first six triangular numbers.
- Use $T_n = \frac{n(n+1)}{2}$ to find T_{20} .
- Determine whether 210 is a triangular number.
- Explain how the diagram suggests the formula for T_n .

33. (a) A circle has radius 17 cm. A chord is 8 cm from the centre. Find the length of the chord. Also explain why the perpendicular from the centre bisects the chord.

OR

(b) ABCD is a cyclic quadrilateral and side AB is produced to E. If $\angle D = 112^\circ$, find the exterior angle $\angle CBE$. If $\angle A = 78^\circ$, find $\angle C$.

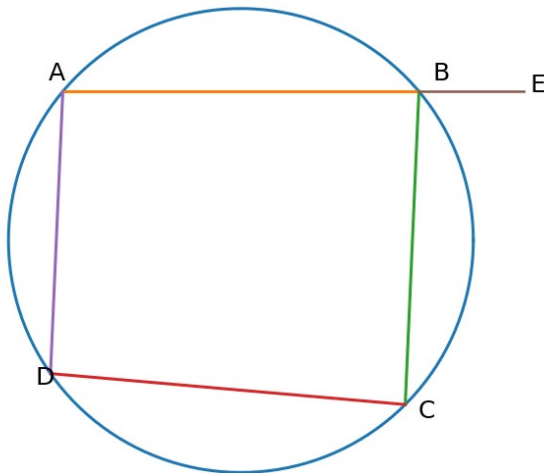


Figure for Question 33(b) only

34. (a) An AP has 40 terms. Its first term is 7 and last term is 124. Find the common difference and the 18th term.

OR

(b) The 3rd term of a GP is 36 and the 5th term is 324. If the common ratio is positive, find the first term, common ratio and 7th term.

35. A circular running track has inner radius 28 m and outer radius 35 m.

(i) Find the area of the track.

(ii) Find the difference between the outer and inner circumferences.

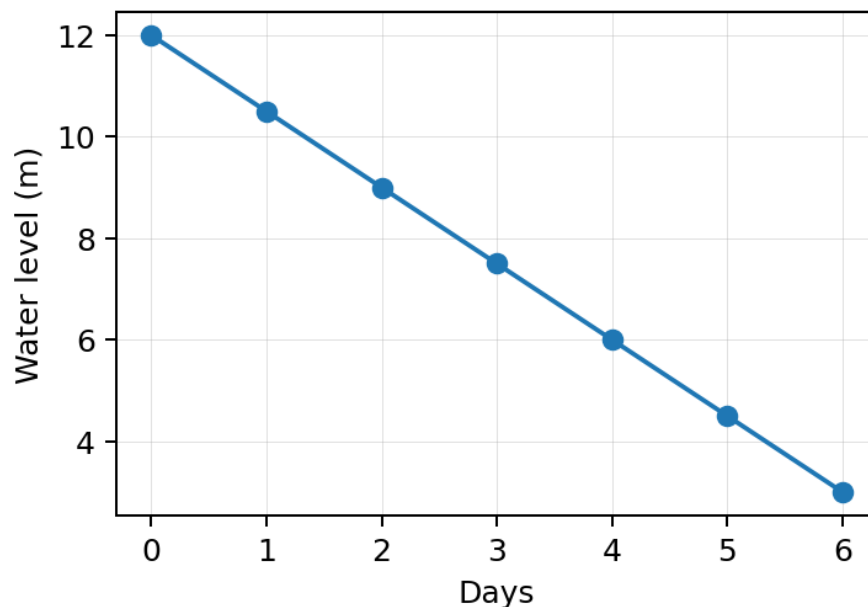
(iii) If resurfacing costs ₹85 per m^2 , find the total cost.

SECTION E

(Questions 36 to 38 are case study based and carry 4 marks each. $3 \times 4 = 12$)

Case Study – 1

36. During summer, the water level in a tank follows the linear rule $h = 12 - 1.5d$, where h is the water level in metres after d days.



Graphical representation for Question 36

(i) Find the initial water level.

(ii) Find the water level after 4 days.

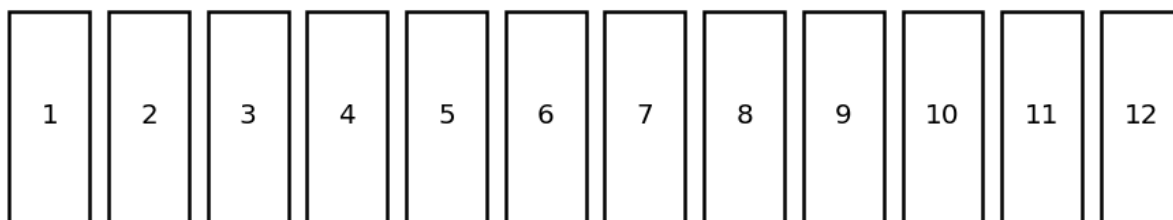
(iii) (a) After how many days will the level become 3 m?

OR

(iii) (b) Write two ordered pairs from the rule and explain why the graph is a straight line.

Case Study – 2

37. Twelve identical cards numbered 1 to 12 are placed in a box and one card is drawn at random.



Cards for Question 37

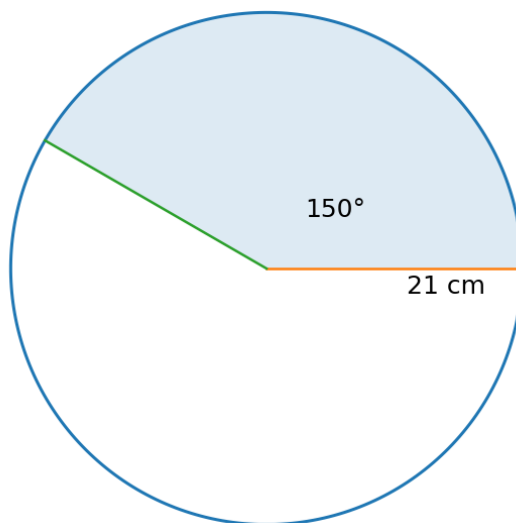
- (i) Find the probability of drawing 12.
- (ii) Find the probability of drawing a multiple of 4.
- (iii) (a) Find the probability of drawing a prime number.

OR

- (iii) (b) Find the probability of drawing a number that is a factor of 12.

Case Study – 3

38. A circular decorative panel has radius 21 cm. A sector of angle 150° is painted.



Painted sector for Question 38

- (i) Find the circumference of the panel.
- (ii) What fraction of the complete circle is painted?
- (iii) (a) Find the area of the painted sector.

OR

- (iii) (b) Find the area of the unpainted part.