

Mathematics
Sample Question Paper – 7
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 carry 2 marks each.
 - (5) Section C: Questions 26-31 carry 3 marks each.
 - (6) Section D: Questions 32-35 carry 5 marks each.
 - (7) Section E: Questions 36-38 are case study based and carry 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 $\pi = 22/7$ unless otherwise stated. Calculators are not allowed.
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SECTION A

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

1. The point dividing the segment joining (2, 4) and (8, 4) into two equal parts is:

- | | |
|------------|------------|
| (A) (4, 4) | (B) (5, 4) |
| (C) (6, 4) | (D) (5, 8) |

2. The distance between $(-1, 2)$ and $(-1, -5)$ is:

- | | |
|-------|----------------|
| (A) 3 | (B) 5 |
| (C) 7 | (D) $\sqrt{7}$ |

3. If $p(x) = 4x - 9$, then $p(3)$ is:

- | | |
|-------|--------|
| (A) 3 | (B) 5 |
| (C) 9 | (D) 12 |

4. The graph shown represents $y = 2x + 3$. Its y-intercept is:

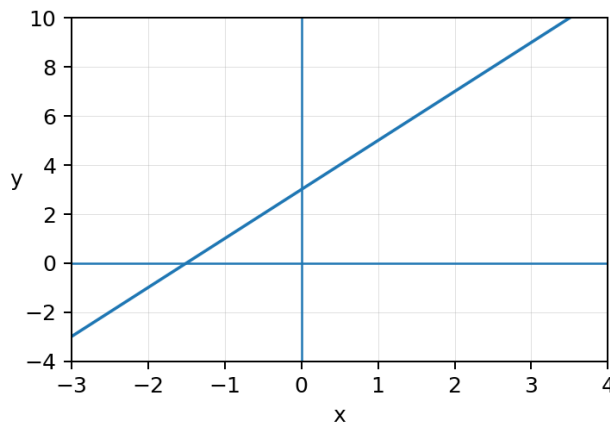


Figure for Question 4

- | | |
|--------|--------|
| (A) -3 | (B) -2 |
| (C) 2 | (D) 3 |

5. Which fraction has a terminating decimal expansion?

- (A) $\frac{7}{12}$ (B) $\frac{13}{25}$
(C) $\frac{11}{18}$ (D) $\frac{5}{21}$

6. Which is an irrational number?

- (A) $\sqrt{64}$ (B) 0.1010010001...
(C) 0.625 (D) $-\frac{7}{9}$

7. $(x + 5)^2 - (x - 5)^2$ equals:

- (A) $10x$ (B) $20x$
(C) $25x$ (D) $100x$

8. One factor of $a^3 + b^3$ is:

- (A) $a - b$ (B) $a + b$
(C) $a^2 + b^2$ (D) $a^2 - ab - b^2$

9. The line joining the centre of a circle to the midpoint of a chord is:

- (A) parallel to chord (B) perpendicular to chord
(C) tangent (D) diameter always

10. If an arc subtends 70° at a point on the circle, it subtends at the centre:

- (A) 35° (B) 70°
(C) 140° (D) 290°

11. Heron's formula uses:

- (A) radius only (B) three sides and semi-perimeter
(C) base only (D) diameter

12. Area of a 60° sector of radius 21 cm is:

- (A) 77 cm^2 (B) 154 cm^2
(C) 231 cm^2 (D) 462 cm^2

13. The equal-sector spinner shown is spun once. Probability of getting C is:

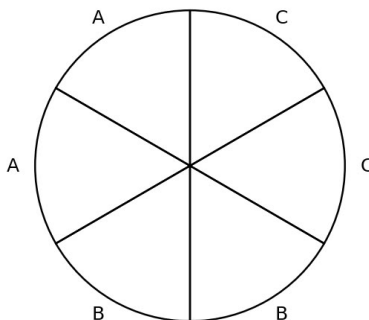


Figure for Question 13

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

14. A die is rolled 120 times and 6 appears 18 times. Experimental probability of 6 is:

- (A) $\frac{3}{20}$ (B) $\frac{1}{6}$
(C) $\frac{17}{20}$ (D) $\frac{18}{20}$

15. The 20th term of AP 9, 14, 19, ... is:

- (A) 99 (B) 104
(C) 109 (D) 114

16. Which term of AP 4, 9, 14, ... is 69?

- (A) 12th (B) 13th
(C) 14th (D) 15th

17. Common ratio of GP -3, 12, -48, 192, ... is:

- (A) -4 (B) 4
(C) -3 (D) 3

18. If $t_n = 2^n$, then t_6 is:

- (A) 12 (B) 32
(C) 64 (D) 128

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): 0.125 is rational.

Reason (R): Every terminating decimal can be expressed as $\frac{p}{q}$, $q \neq 0$.

20. Assertion (A): Opposite angles of a cyclic quadrilateral add to 180° .

Reason (R): Each pair of opposite angles together subtends the complete circle.

SECTION B

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

21. (a) Find the midpoint of A(-5, 7) and B(9, -3).

OR

(b) A point lies on the y-axis and is 6 units below the origin. Write its coordinates and its distance from (0,4).

22. $P(3, 2)$ is reflected in the y -axis to P' as shown. Write the coordinates of P' and find PP' .

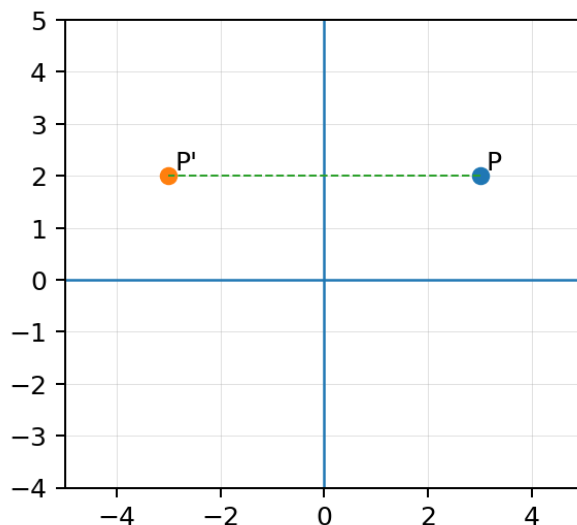


Figure for Question 22

23. Using a suitable identity, find 49×51 .

24. (a) A circle has radius 10 cm. Find the circumference and area.

OR

(b) A 90° arc belongs to a circle of radius 14 cm. Find its length.

25. In the circle shown, $AB = CD$. What relation exists between the angles subtended by AB and CD at O ? Give the theorem.

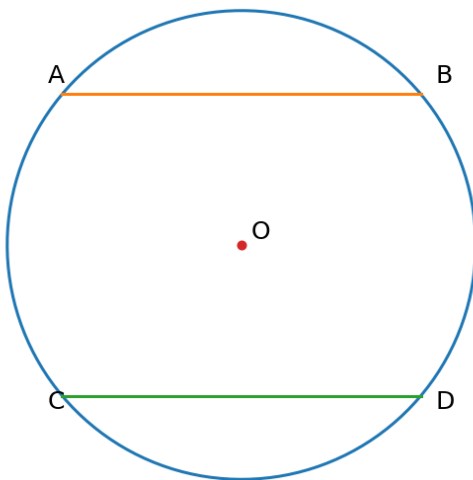


Figure for Question 25

SECTION C

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

26. Find four rational numbers between $\frac{5}{7}$ and $\frac{6}{7}$.

27. The area model shown corresponds to an algebraic product. Write the product and expand it by adding the four regions.

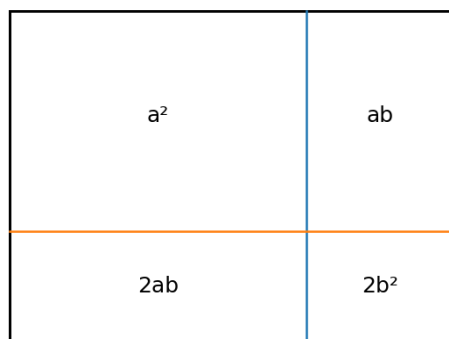


Figure for Question 27

28. (a) The graph of $p(x) = 3x + b$ passes through $(2, 11)$. Find b and the zero of $p(x)$.

OR

(b) A line has slope -2 and y -intercept 7 . Write its equation and find where it cuts the x -axis.

29. Prove that chords of a circle equidistant from its centre are equal.

30. A triangle has sides 7 cm, 15 cm and 20 cm. Find its area using Heron's formula.

31. (a) A coin is tossed and then a three-number spinner $\{1, 2, 3\}$ is spun. Use the tree diagram to list the sample space and find the probability of getting H and an even number.

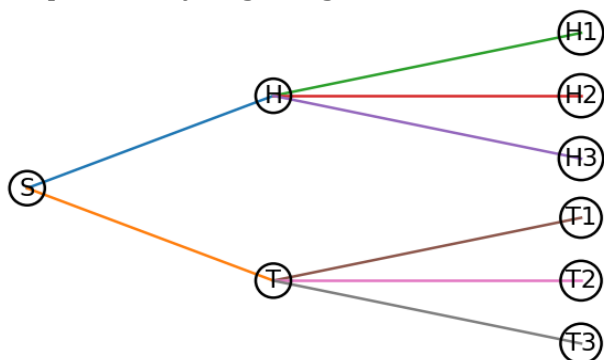


Figure for Question 31(a) only

OR

(b) Cards numbered 21 to 30 are placed in a box. One is chosen at random. Find the probability that it is (i) a multiple of 3 , (ii) a prime number.

SECTION D

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

32. An AP has 25 terms. Its 4 th term is 17 and its 19 th term is 77 . Find the first term, common difference and 25 th term. Also write its recursive rule.

33. A tile pattern grows as shown. The numbers of tiles in Stages 1, 2, 3, 4 are 3, 5, 7, 9.

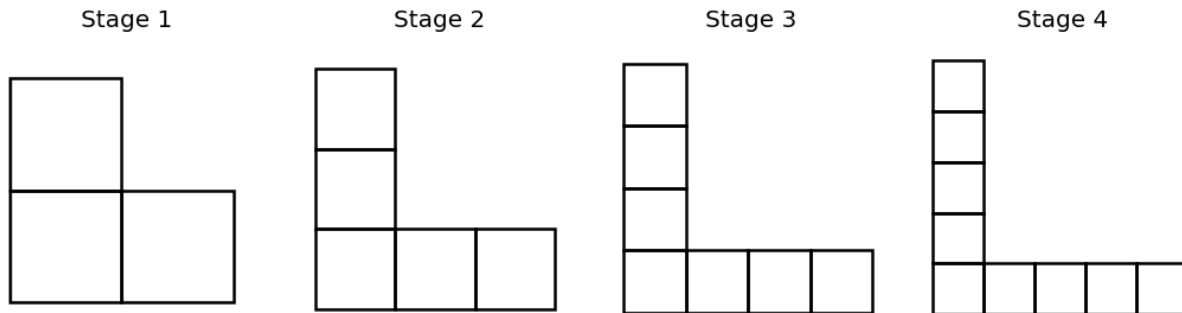


Figure for Question 33

- Explain why the sequence is an AP.
- Find the n th term.
- Find the number of tiles in Stage 40.
- Determine whether a stage can contain 100 tiles. Give a reason.

34. (a) In a circle of radius 15 cm, a chord is 9 cm from the centre. Find its length. Prove the result you use about the perpendicular from the centre to a chord.

OR

(b) Two equal chords AB and CD of a circle intersect inside the circle. Explain why they subtend equal angles at the centre and state one more consequence of equal chords.

35. A chord of a circle of radius 10.5 cm subtends 120° at the centre, as shown.

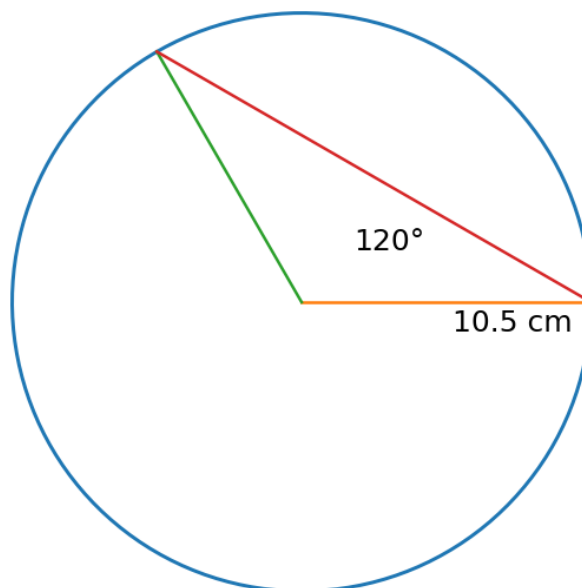


Figure for Question 35

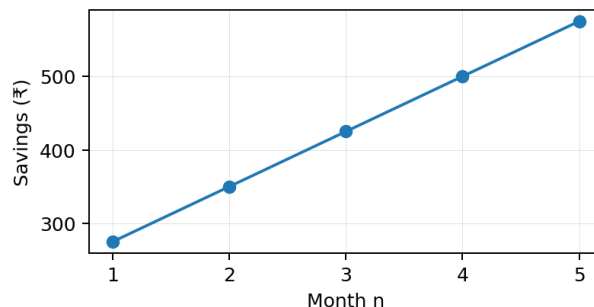
- Find the area of the 120° sector.
- Find the area of the triangle formed by the two radii and chord, taking $\sqrt{3} = 1.732$.
- Hence find the area of the minor segment.

SECTION E

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

Case Study – 1

36. Riya starts with ₹200 and saves ₹75 every month. Her savings after n months follow a linear pattern.



Savings pattern for Question 36

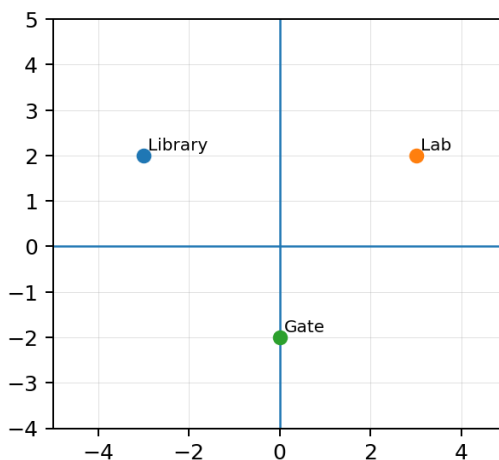
- (i) How much does her saving increase each month?
- (ii) Find her savings after 4 months.
- (iii) (a) Write a linear expression for her savings after n months and find the amount after 12 months.

OR

- (iii) (b) After how many months will her savings first become ₹1100?

Case Study – 2

37. On a school map, the Library is at $(-3, 2)$, the Laboratory at $(3, 2)$ and the Gate at $(0, -2)$.



Coordinate map for Question 37

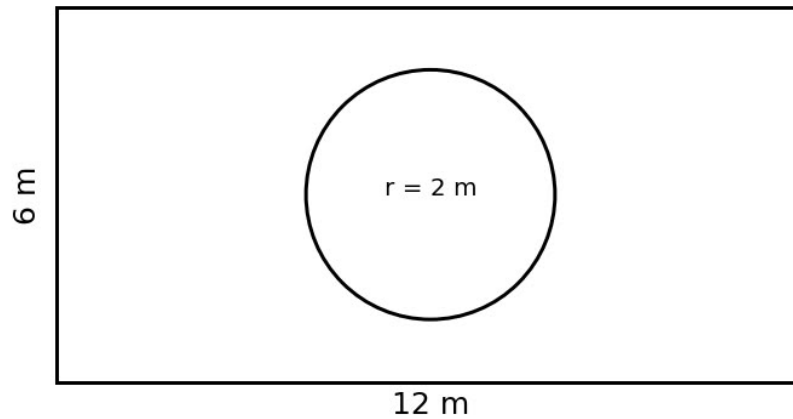
- (i) Find the distance between Library and Laboratory.
- (ii) Find the midpoint of the Library-Laboratory segment.
- (iii) (a) Find the distance from the Gate to the midpoint.

OR

- (iii) (b) State the reflection of the Library point in the y -axis and identify which marked location it coincides with.

Case Study – 3

38. A rectangular practice court is 12 m by 6 m. A circular logo of Tiwari Academy radius 2 m is painted at its centre.



Court and circular logo for Question 38

- (i) Find the area of the court.
- (ii) Find the area of Tiwari Academy circular logo.
- (iii) (a) Find the unpainted area of the court.

OR

- (iii) (b) If painting the logo costs ₹50 per m^2 , find the painting cost.