

Mathematics — Ganita Manjari
Sample Question Paper 20
Class IX | 2026-27

Time Allowed: 3 Hours

Maximum Marks: 80

General Instructions

1. This question paper contains 38 questions. All questions are compulsory.
2. The question paper is divided into five sections A, B, C, D and E.
3. Section A has 18 MCQs and 2 assertion–reason questions of 1 mark each.
4. Section B has Questions 21 to 25 of 2 marks each.
5. Section C has Questions 26 to 31 of 3 marks each.
6. Section D has Questions 32 to 35 of 5 marks each.
7. Section E has Questions 36 to 38, case studies of 4 marks each, with subparts of 1, 1 and 2 marks.
8. There is no overall choice. Internal choice is provided in two questions each in Sections B, C and D, and in the 2-mark subpart of each case study in Section E.
9. Draw neat figures wherever required. Use $\pi = 22/7$ unless another value is stated.
10. Use of calculators is not allowed.

SECTION A

(20 questions $\times$ 1 mark = 20 marks)

1. What is the x-coordinate of a point on the y-axis?

- | | |
|--------|-------------------------|
| (A) 1 | (B) 0 |
| (C) -1 | (D) Any non-zero number |

2. The area of a right-angled triangle is 54 sq. cm. One of its legs has length 12 cm. Find its perimeter.

- | | |
|-----------|-----------|
| (A) 36 cm | (B) 42 cm |
| (C) 48 cm | (D) 30 cm |

3. How many lines exist that have a given slope?

- | | |
|-----------------|---------------------|
| (A) Exactly one | (B) Infinitely many |
| (C) None | (D) Exactly two |

4. What is the constant term of the polynomial $9x^3 + 5x^2 - 8x - 10$?

- | | |
|---------|--------|
| (A) -10 | (B) -8 |
| (C) 5 | (D) 9 |

5. Factor completely: $9m^2 - 12m + 4$.

- | | |
|------------------|------------------|
| (A) $(3m + 2)^2$ | (B) $(3m - 2)^2$ |
| (C) $(3m - 4)^2$ | (D) $(9m - 2)^2$ |

6. A rational number in its lowest form has denominator $2^3 \times 5$. How many decimal places will its decimal expansion have? Explain your answer.

- (A) 3 (B) 2
(C) 4 (D) 1

7. Find S_{1000} , the sum of the first 1000 natural numbers.

- (A) 500501 (B) 500499
(C) 500500 (D) 500502

8. After Over 19, a team's run rate was 6. What is the run rate after 20 overs given the team made 12 runs in the last over?

- (A) 6.0 (B) 9.0
(C) 6.6 (D) 6.3

9. Find the value of the quadratic polynomial $7s^2 - 4s + 6$ if $s = -3$.

- (A) 80 (B) 83
(C) 81 (D) 82

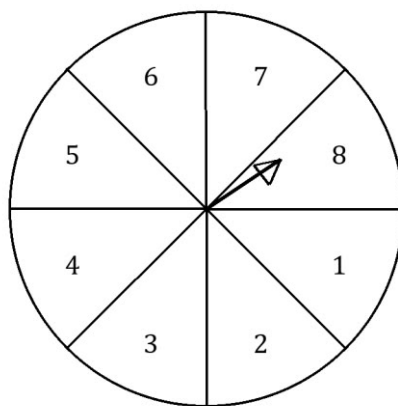
10. Find the degree of the following polynomial: $y^3 + 2y - 1$.

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

11. If $x - y = 23$ and $xy = 21$, find $x^2 + y^2$.

- (A) 529 (B) 569
(C) 573 (D) 571

12. A game of chance consists of spinning an arrow, which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8, and these are equally likely outcomes. What is the probability that it will point at an odd number?



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

13. Tossing a fair coin has a probability of _____ for getting heads.

- (A) 0
(B) $\frac{1}{2}$
(C) 1
(D) 2

14. Find the value of 85^2 using a suitable identity.

- (A) 7226
(B) 7224
(C) 7227
(D) 7225

15. If a quadrilateral is a square, then all its angles are equal. Is the converse true?

- (A) No; a non-square rectangle is a counterexample
(B) No; a square is a counterexample
(C) Yes; all rectangles are squares
(D) Yes; equal angles imply equal sides

16. Factor completely: $4s^2 + 20st + 25t^2$.

- (A) $(4s + 5t)^2$
(B) $(2s - 5t)^2$
(C) $(2s + 25t)^2$
(D) $(2s + 5t)^2$

17. Factor completely: $49x^2 + 28xy + 4y^2$.

- (A) $(7x - 2y)^2$
(B) $(7x + 2y)^2$
(C) $(7x + 4y)^2$
(D) $(49x + 2y)^2$

18. Let ABCD be a quadrilateral. List all sides of ABCD adjacent to side AB. List all sides opposite to AB.

- (A) Adjacent: BC, CD; opposite: AD
(B) Adjacent: AD, BC; opposite: CD
(C) Adjacent: AD, CD; opposite: BC
(D) Adjacent: AC, BD; opposite: CD

For Questions 19 and 20, choose the correct option:

- (A) Both A and R are true, and R is the correct explanation of A.
(B) Both A and R are true, but R is not the correct explanation of A.
(C) A is true, but R is false.
(D) A is false, but R is true.

19. Assertion (A): The point (22, 68) lies on the line $y = 3x + 1$.

Reason (R): A point lies on a line when its coordinates satisfy the equation of the line.

20. Assertion (A): The positive integer 484 has an odd number of positive divisors.

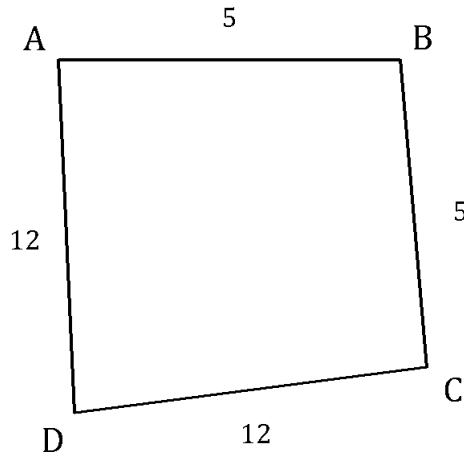
Reason (R): In a perfect square, divisors pair to give the number, with its positive square root paired with itself.

SECTION B

(5 questions $\times$ 2 marks = 10 marks)

21. Find the 10th and nth terms of the GP: 5, 25, 125, ...

22. (A) A cyclic quadrilateral has sides 5, 5, 12, 12 units. Find its area.



OR

(B) Quadrilateral PQRS is inscribed in a circle. If $\angle P = (2x + 10)^\circ$ and $\angle R = (3x - 20)^\circ$, find the value of x and the measures of $\angle P$ and $\angle R$.

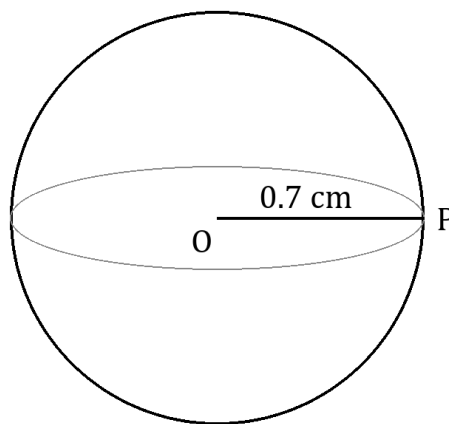
23. Convert $\frac{7}{20}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

24. (A) If you have ₹800 and you save ₹250 every month, find the amount you have after (i) 6 months (ii) 2 years. Express this as a linear pattern.

OR

(B) Find 6 rational numbers between 3 and 4.

25. A ball bearing has a radius of 0.7 cm. Find its surface area.



SECTION C

(6 questions $\times$ 3 marks = 18 marks)

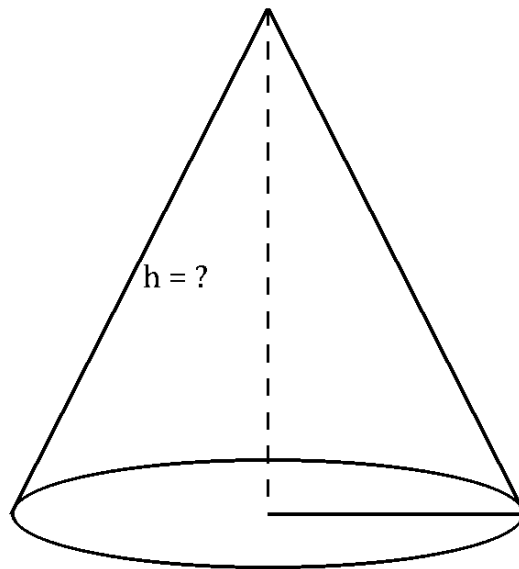
26. (A) Write an algorithm $\text{prime}(n)$ to check if n is prime.

OR

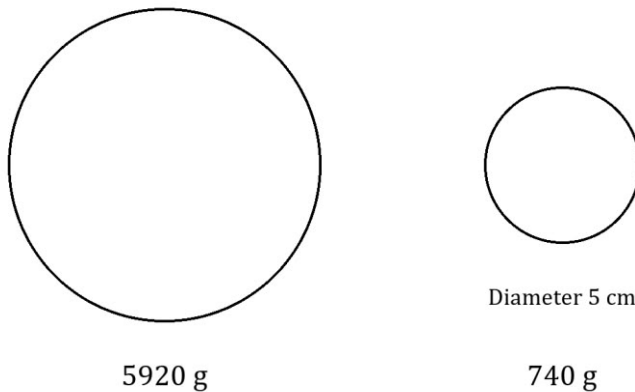
(B) Check if the points R $(-5, -1)$, B $(-2, -5)$ and C $(4, -12)$ are on the same straight line. Now plot the points and check your answer.

27. Simplify the rational expression $\frac{x^2 - 7x + 12}{5x^2 + 5x - 100}$, assuming that $5x^2 + 5x - 100 \neq 0$.

28. The surface area of a sphere of radius 5 cm is five times the area of the curved surface of a cone of radius 4 cm. Find the height and the volume of the cone.



29. (A) Two solid spheres made of the same metal have weights 5920 g and 740 g. Determine the radius of the larger sphere, if the diameter of the smaller one is 5 cm.



OR

(B) Write an algorithm $\text{primedivisors}(n)$ to compute the list of divisors of n that are prime numbers.

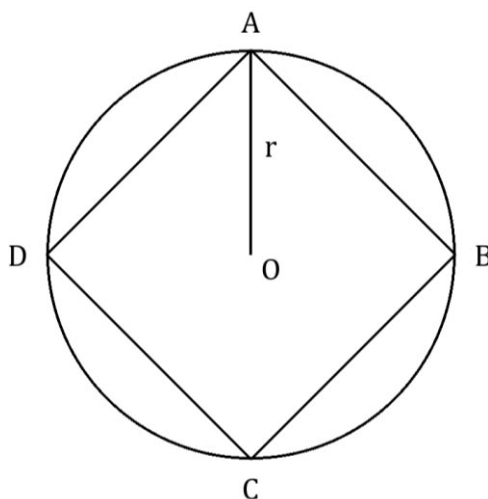
30. A tyre company records distances before replacement in 1000 cases: less than 4000 km: 20; 4001–9000 km: 210; 9001–14000 km: 325; more than 14000 km: 445. Find the probability that a randomly chosen tyre lasts (i) less than 4000 km, (ii) between 4000 and 14000 km, (iii) more than 14000 km.

31. A sequence is given by the recursive rule $t_1 = 2, t_{n+1} = 3t_n - 2$ for $n \geq 1$. Which term of the sequence is 730?

SECTION D

(4 questions $\times$ 5 marks = 20 marks)

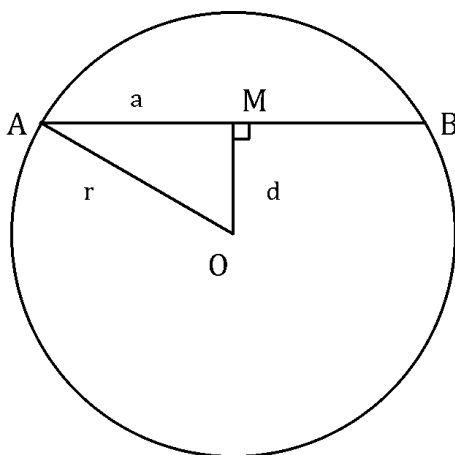
32. (A) A square is inscribed in a circle of radius r . Show that the ratio of the area of the square to the area of the circle is $\frac{2}{\pi}$.



OR

(B) The coach of a cricket team buys 7 bats and 6 balls for ₹8880. Later, she buys 3 bats and 5 balls for ₹4000. Find the cost of each bat and each ball.

33. (A) Prove that the perpendicular bisector of a chord passes through the centre of the circle.



OR

(B) Prove that the midpoints of the sides of a quadrilateral form a parallelogram.

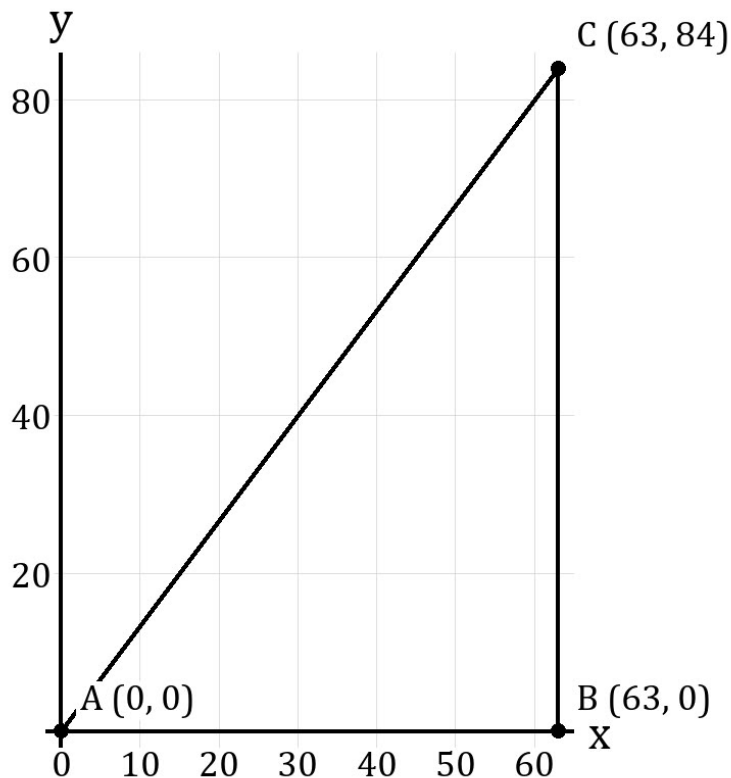
34. Let $p(x) = ax + b$ and $q(x) = cx + d$ be two linear polynomials such that (i) $p(0) = 5$, (ii) the polynomial $p(x) - q(x)$ cuts the x -axis at $(3, 0)$, (iii) $p(x) + q(x)$ is equal to $6x + 4$ for all real x . Find the polynomials $p(x)$ and $q(x)$.

35. The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

SECTION E

(3 questions $\times$ 4 marks = 12 marks)

36. A school survey marks three points on a square coordinate grid: A (0, 0), B (63, 0) and C (63, 84). One grid unit represents one metre. The path A–B–C follows two perpendicular sides of the school garden.

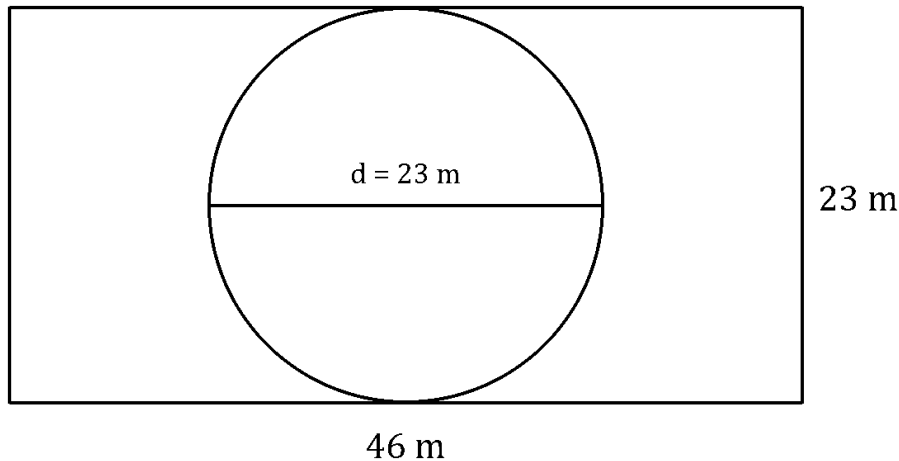


- (i) Find the length AB.
- (ii) Find the length BC.
- (iii) (A) Calculate the direct distance AC and the perimeter of triangle ABC.

OR

- (iii) (B) Find the coordinates of the midpoint M of AC and its distance from A.

37. A rectangular lawn measures 46 m by 23 m. A circular flowerbed of diameter 23 m is placed wholly inside it, as shown in figure. Express answers involving the circle in terms of π .



- (i) Find the area of the rectangular lawn.
- (ii) Find the radius of the flowerbed.
- (iii) (A) Find the flowerbed area and the lawn area outside it.

OR

- (iii) (B) Find the outer perimeter of the lawn and the circumference of the flowerbed.

38. A printing service prepares practice booklets for Tiwari Academy. Its charge is a fixed setup fee of ₹80 plus ₹24 per booklet. If x booklets are ordered, the total charge is represented by $C(x)$.

- (i) Write the linear polynomial $C(x)$.
- (ii) Find $C(0)$ and explain its meaning.
- (iii) (A) Find the charge for 10 booklets and the extra charge for increasing the order to 15 booklets.

OR

- (iii) (B) Tiwari Academy pays ₹656. How many booklets were ordered?