

Mathematics — Ganita Manjari

Sample Question Paper 12

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. Justify why the plane cannot be tiled with a regular pentagon.

- (A) Its angles total 360°
- (B) 108° does not divide 360°
- (C) Its sides cannot be equal
- (D) It has no diagonals

2. The diameter of a circle is AB. Point C is on the circumference. What is the measure of $\angle ACB$? Explain your reasoning.

- (A) 60°
- (B) 180°
- (C) 90°
- (D) 45°

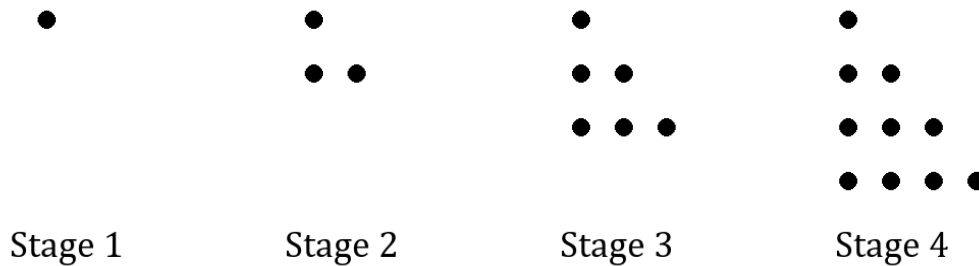
3. Find the value of the quadratic polynomial $7s^2 - 4s + 6$ if $s = -3$.

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

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

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

5. Find the 17th triangular number.



- (A) 155
(C) 152

- (B) 153
(D) 154

6. How many lines exist that have a given slope and pass through a given point?

- (A) None
(C) Exactly one

- (B) Exactly two
(D) Infinitely many

7. If $x - y = 15$ and $xy = 13$, find $x^2 + y^2$.

- (A) 249
(C) 253

- (B) 225
(D) 251

8. Factor completely: $9x^2 + 24xy + 16y^2$.

- (A) $(3x - 4y)^2$
(C) $(9x + 16y)^2$

- (B) $(3x + 2y)^2$
(D) $(3x + 4y)^2$

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

- (A) 48 cm
(C) 30 cm

- (B) 42 cm
(D) 36 cm

10. Find the value of 79^2 using a suitable identity.

- (A) 6241
(C) 6240

- (B) 6243
(D) 6242

11. Find the value of 1120^2 using a suitable identity.

- (A) 1254401
(C) 1254399

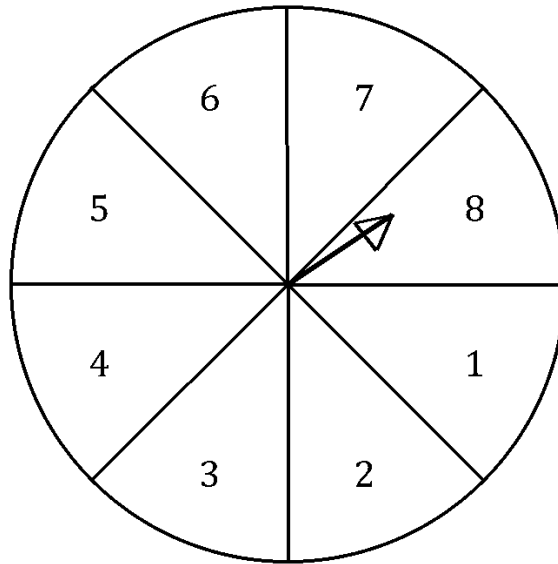
- (B) 1254402
(D) 1254400

12. In a circle with centre O, the central angle AOB is 60° . If the radius of the circle is 12 cm, what is the length of the chord AB?

- (A) 18 cm
(C) 12 cm

- (B) 6 cm
(D) 24 cm

13. 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 a number greater than 2?



(A) $\frac{3}{4}$
(C) $\frac{1}{2}$

(B) $\frac{1}{4}$
(D) $\frac{7}{8}$

14. Find the value of the linear polynomial $5x - 3$ if $x = -1$.

(A) -6
(C) -8

(B) -7
(D) -9

15. How many small cubes with side 20 cm can be packed tight in a cubical box with side 2 m?

(A) 1000
(C) 1001

(B) 999
(D) 1002

16. If n is divisible by 24, then it is divisible by both 4 and 6. Is the converse true?

(A) No; $n = 12$ is a counterexample
(C) Yes; $4 \times 6 = 24$

(B) No; $n = 24$ is a counterexample
(D) Yes for every positive integer n

17. The probability of an impossible event is _____.

(A) 1
(C) $\frac{1}{2}$

(B) 0
(D) -1

18. Is 1, 3, 9, 27, 81, ... a geometric progression? If so, what is the common ratio?

(A) No
(C) Yes; 3

(B) Yes; 4
(D) Yes; 1

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 (14, 44) 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 196 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 5 rational numbers between $\frac{2}{5}$ and $\frac{3}{5}$.

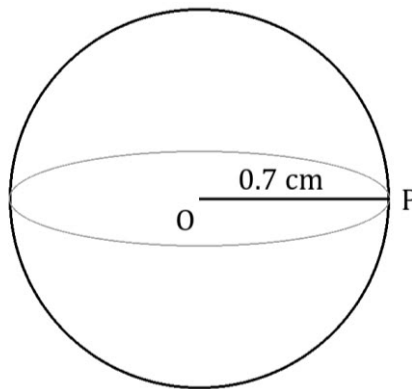
22. (A) Execute the algorithm to compute the divisors of 15.

OR

(B) State whether M is the midpoint of segment ST. Justify your answer.

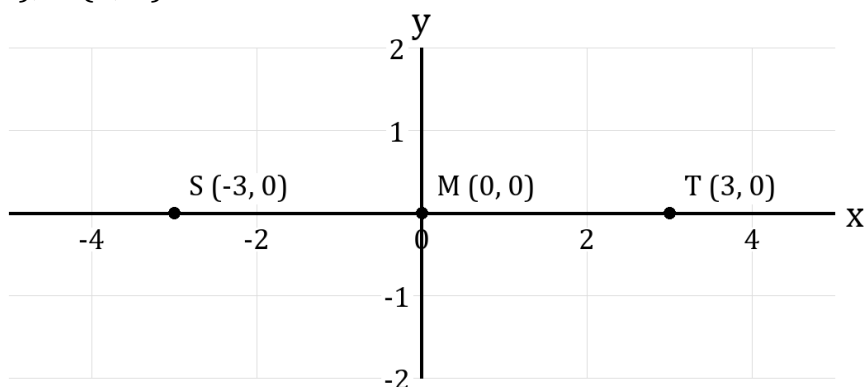
S (2, 3), M (3, 4), T (4, 5).

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



24. State whether M is the midpoint of segment ST. Justify your answer.

S (-3, 0), M (0, 0), T (3, 0).



25. (A) A white stork's migration is tracked. The average daily distance travelled, calculated over 20 days, is 44.5 km. On the 21st day, it flew 55 km. What is the average daily distance travelled over these 21 days? Make a guess before you calculate.

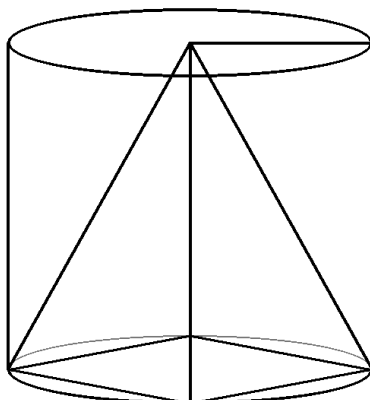
OR

(B) Convert $\frac{4}{15}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

SECTION C

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

26. A cylinder has base radius r cm and height h cm. A square pyramid is fitted inside it. The square base of the pyramid lies on the base of the cylinder, its corners on the boundary of the cylinder. The apex of the pyramid lies on the top of the cylinder. Find the ratio of the volume of this pyramid to the volume of the cylinder.



27. (A) Find the value of $x^3 - 8y^3 - 36xy - 216$, when $x = 2y + 6$.

OR

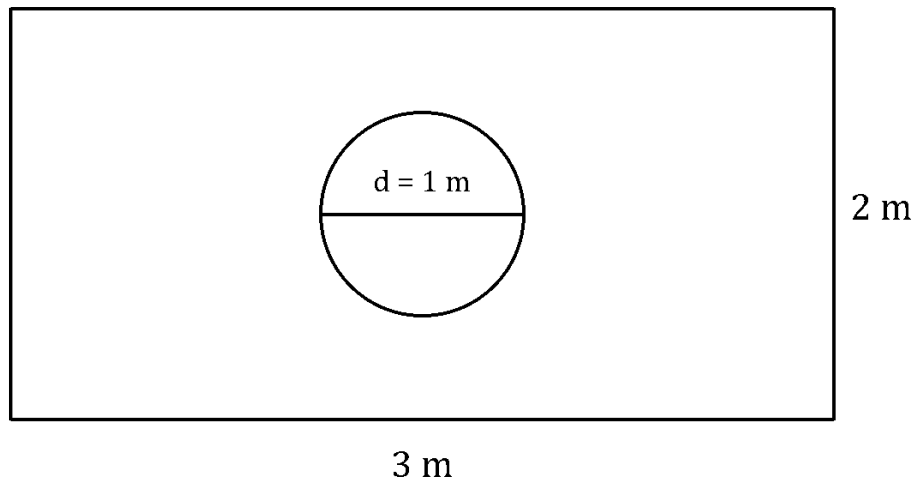
(B) The sides of a triangle have lengths 7 cm, 24 cm, 25 cm. Find the area of the triangle in two different ways.

28. (A) A learning platform charges a fixed monthly fee and an additional cost per digital learning module accessed. A student observes that when she accessed 10 modules, her bill was ₹400. When she accessed 14 modules, her bill was ₹500. If the monthly bill y depends on the number of modules accessed, x , according to the relation $y = ax + b$, find the values of a and b .

OR

(B) At a panipuri stall, the concentration of spice in the pani was 8%. What quantity of regular water should be mixed into the 10 litres of pani so that the spice level is reduced to three-fourths of the original concentration?

29. Suppose you drop a dye at random on the rectangular region shown in figure. What is the probability that it will land inside the circle with a diameter of 1 m?



30. If the 4th, 10th and 16th terms of a GP are x , y and z respectively, prove that x , y , z are in GP.

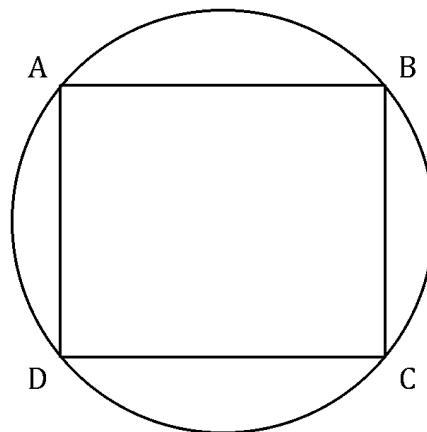
31. The surface area of a sphere of radius 5 cm is five times the area of the curved surface of a cone of radius 4 cm. Find the height and the volume of the cone.

SECTION D

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

32. 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 $q(x)$.

33. Show that rectangle is the only parallelogram that can be inscribed in a circle.



34. (A) Meena went to a bank to withdraw ₹2000. She asked the cashier to give her ₹50 and ₹100 notes only. Meena got 25 notes in all. Find how many notes of ₹50 and ₹100 she received.

OR

(B) The diagonals AC and BD of a parallelogram ABCD intersect at O. A line through O meets AB and CD at points P and Q respectively. Show that O is the midpoint of PQ.

35. (A) The sum of the first three terms of a geometric progression is 26, and the sum of their squares is 364. Find the terms of the GP.

OR

(B) 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)

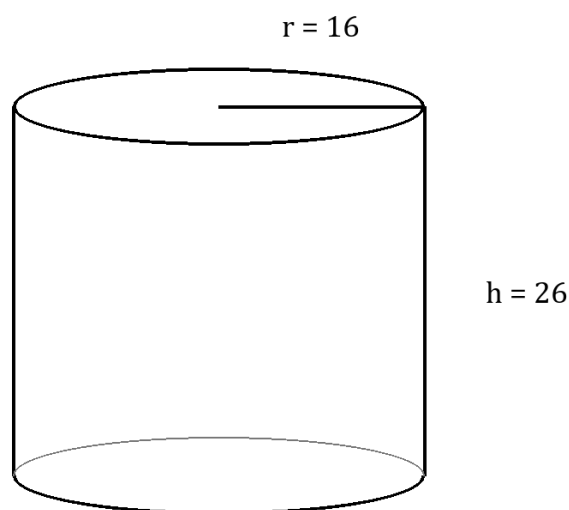
36. Tiwari Academy combines the results of two practice groups. Group A has 22 students with mean score 62; Group B has 27 students with mean score 72. All students took the same test.

- (i) Find the total of Group A's scores.
- (ii) How many students are in the two groups together?
- (iii) (A) Find the combined mean score.

OR

(iii) (B) A new student joins Group B with score 77. Find the new mean of Group B.

37. A craft group makes a closed cylindrical storage box. In figure, its radius is 16 cm and its height is 26 cm. Give answers in terms of π .

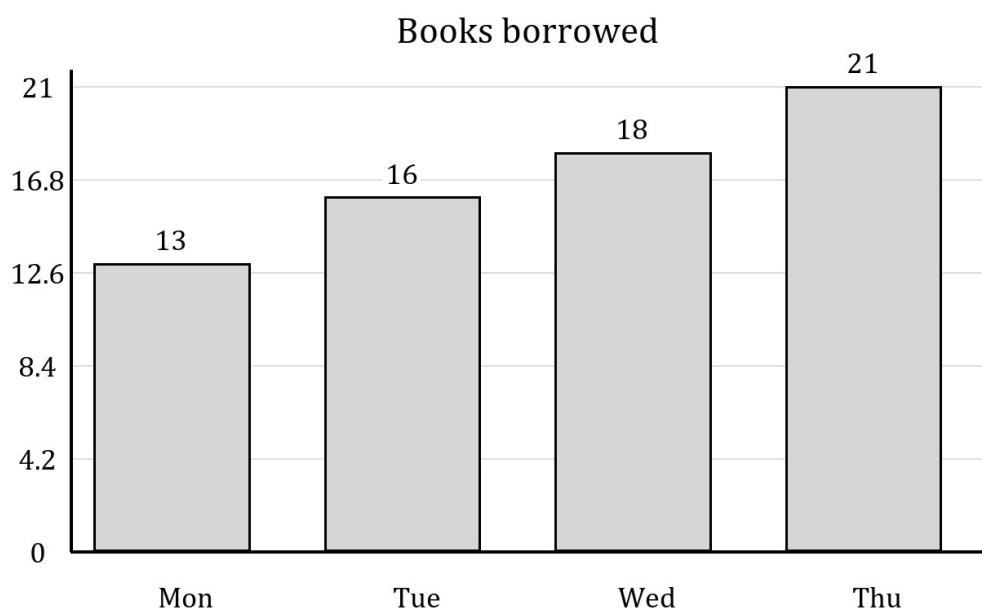


- (i) Find the base diameter.
- (ii) Find the area of one circular base.
- (iii) (A) Find the curved surface area and the total surface area.

OR

(iii) (B) Find the volume. If the height is doubled and the radius is unchanged, find the new volume.

38. The bar chart shows the numbers of books borrowed from a classroom library on four days. Each book is counted once on the day it is borrowed.



(i) Which day has the greatest number of books borrowed?

(ii) Find the total number borrowed in the four days.

(iii) (A) Calculate the mean daily number of books borrowed.

OR

(iii) (B) On Friday, 22 books are borrowed. Find the new mean for all five days.