

Mathematics — Ganita Manjari

Sample Question Paper 17

Class IX | 2026-27

Time Allowed: 3 Hours

Maximum Marks: 80

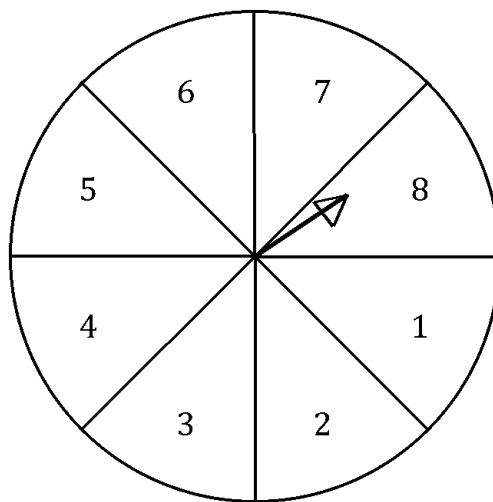
General Instructions

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. 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 multiple of 3?



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

(B) $\frac{1}{2}$

(C) $\frac{1}{4}$

(D) $\frac{3}{8}$

2. If $x - y = 20$ and $xy = 18$, find $x^2 + y^2$.

(A) 438

(B) 434

(C) 436

(D) 400

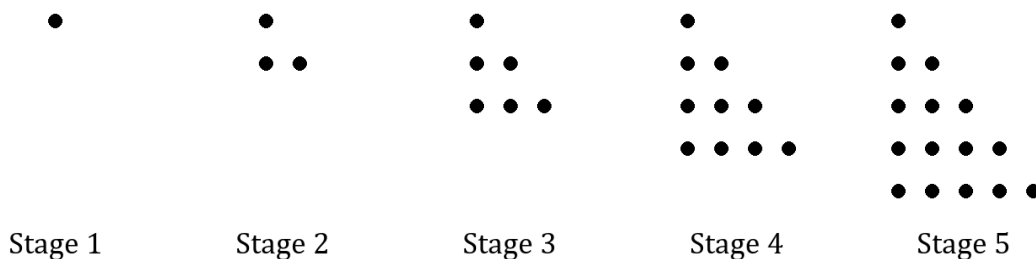
3. Justify why the plane cannot be tiled with a regular pentagon.

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

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

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

5. A child arranges marbles in rows so that the first row has 1 marble, the second has 2 marbles, the third has 3, and so on up to 25 rows. How many marbles does the child use in all?



- (A) 325 (B) 326
(C) 327 (D) 324

6. You are given two options: (A) one chocolate cube of side 50 mm, (B) hundred chocolate cubes of side 10 mm. Which option gives you more chocolate?

- (A) Cannot be determined (B) Option A
(C) Both give equal amounts (D) Option B

7. Find the value of $(199)^3$ using a suitable identity.

- (A) 7880599 (B) 7880601
(C) 7880598 (D) 7880600

8. 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) 90°
(C) 180° (D) 45°

9. Find the value of $(147)^3$ using a suitable identity.

- (A) 3176524 (B) 3176525
(C) 3176523 (D) 3176522

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

- (A) -8 (B) -7
(C) -9 (D) -6

11. Given some data with corresponding weights, how would the weighted average change if all the weights are doubled?

- (A) It remains unchanged (B) It doubles
(C) It increases by 2 (D) It halves

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

- (A) Yes; 3 (B) No
(C) Yes; 1 (D) Yes; 4

13. Find the smallest value of n such that the sum of the first n natural numbers is greater than 1000.

- (A) 44 (B) 46
(C) 50 (D) 45

14. Find the value of 1104^2 using a suitable identity.

- (A) 1218817 (B) 1218815
(C) 1218818 (D) 1218816

15. Find the value of 64^2 using a suitable identity.

- (A) 4095 (B) 4098
(C) 4097 (D) 4096

16. What are the coefficients of x^2 and x^3 in the polynomial $x^4 - 3x^3 + 6x^2 - 2x + 7$?

- (A) 6 and -3 (B) -2 and 7
(C) -3 and 6 (D) 6 and 3

17. For real numbers x and y : if $x = y$, then $x^2 = y^2$. Is the converse true?

- (A) Yes for all real x and y
(B) Yes only because squares are positive
(C) No; $x = y = 1$ is a counterexample
(D) No; $x = 1, y = -1$ is a counterexample

18. The surface areas of the three faces of a cuboid that meet at one of the corners of the cuboid are 6 cm^2 , 15 cm^2 , and 10 cm^2 respectively. What is the volume of the cuboid?

- (A) 30 (B) 29
(C) 32 (D) 31

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 (19, 41) lies on the line $y = 2x + 3$.

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

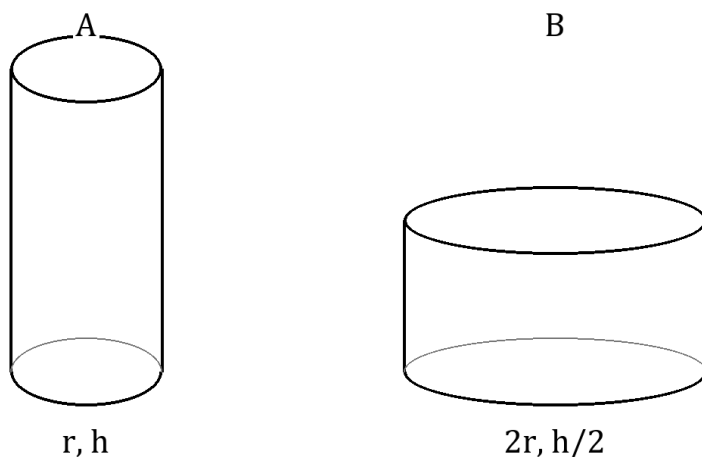
20. Assertion (A): The positive integer 361 has an odd number of positive divisors.

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. Two cylinders, A and B, are given. The radius of cylinder B is twice that of cylinder A, and the height of cylinder B is half that of cylinder A. Find the ratio of the curved surface area of A to the curved surface area of B. Also find the ratio of the volume of A to the volume of B.



22. (A) Execute the algorithm to compute the divisors of 775.

OR

(B) Find the coordinates of B given that M (-7, 1) is the midpoint of A (3, -4) and B (x, y).

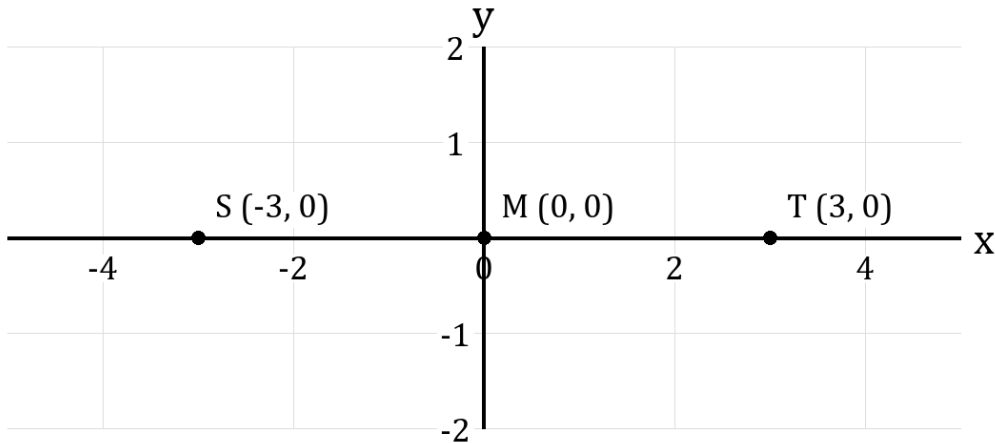
23. (A) Using algebra, explain why $0.99999\dots$ is exactly equal to 1.

OR

(B) Convert $\frac{13}{250}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

24. 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.

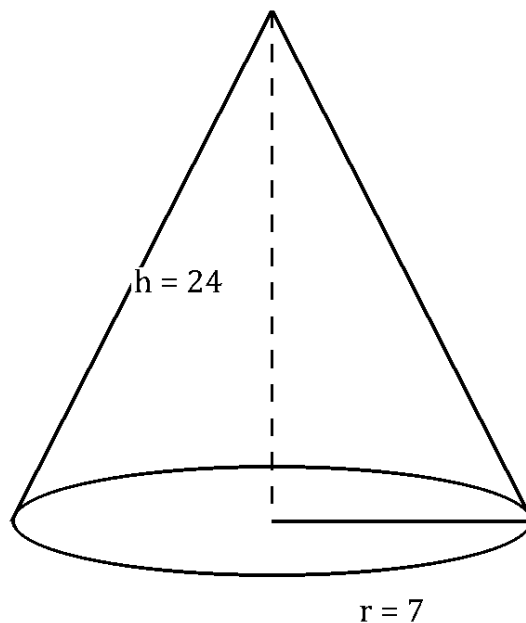
25. State whether M is the midpoint of segment ST. Justify your answer.
S (-3, 0), M (0, 0), T (3, 0).



SECTION C

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

26. (A) A joker's cap is in the form of a right circular cone of base radius 7 cm and height 24 cm. Find the area of the sheet required to make 10 such caps.



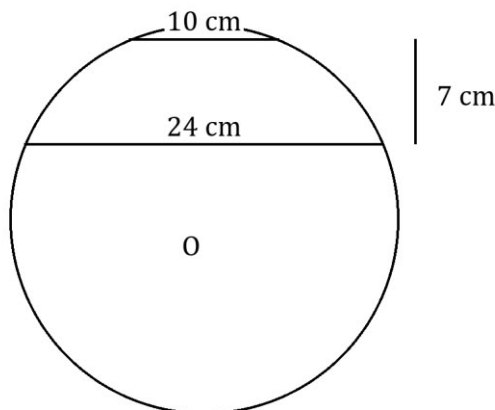
OR

(B) Compute $\text{gcd}(1789287, 237656)$ using the improved version of Euclid's algorithm.

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

28. 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 .

29. Two parallel chords of lengths 10 cm and 24 cm are on the same side of the centre of a circle. The distance between the chords is 7 cm. Find the radius of the circle.



30. (A) A basket contains 4 red balls and 5 blue balls. One ball is drawn and laid aside, and a second ball is drawn. Draw a tree diagram to represent the possible outcomes and probabilities. Use it to find (i) the probability of drawing a red ball and then a blue ball, (ii) the probability of drawing 2 blue balls.

OR

(B) Three coins are tossed simultaneously. Write the sample space and calculate the probability of getting exactly two heads.

31. A telecom company charges a fixed monthly fee and an additional cost per GB of the internet data used. A student observes that when she used 10 GB, her bill was ₹350. When she used 20 GB, her bill was ₹550. If the monthly bill y depends on the amount of data used, x (in GB), according to the relation $y = ax + b$, find the values of a and b .

SECTION D

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

32. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered for every km. For a distance of 10 km, the total amount paid is ₹155 and for a journey of 15 km, the total amount paid is ₹220. What is the fixed charge and the charge per km? How much does a person have to pay for travelling a distance of 25 km?

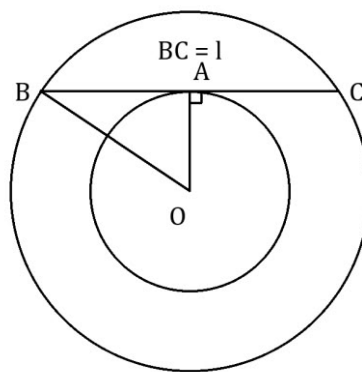
33. (A) The sum of the first three terms of a geometric progression is 26, and the sum of their squares is 364. Find the terms of the GP.

OR

(B) By dividing a trapezium into two triangles show that its area is half the sum of the parallel sides multiplied by the height.

34. Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?

35. (A) In figure, two concentric circles have a common centre O. A chord BC of the larger circle touches the smaller circle at A. The length of BC is l. Show that the area of the region enclosed between the two circles is $\frac{1}{4}\pi l^2$.



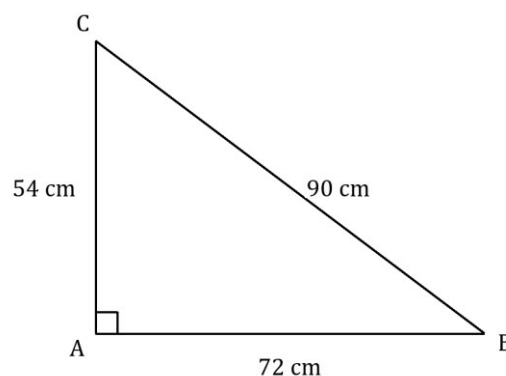
OR

(B) A person is choosing between two mobile plans. Plan A: ₹50 monthly fee + ₹0.20 per minute of call time. Plan B: ₹30 monthly fee + ₹0.30 per minute of call time. For how many minutes of calling per month is Plan A cheaper than Plan B? For how many minutes is Plan B cheaper? Also find the number of minutes at which both plans cost the same.

SECTION E

(3 questions × 4 marks = 12 marks)

36. A triangular panel has sides 54 cm, 72 cm and 90 cm, as shown in figure. Students compare two ways of calculating its area.

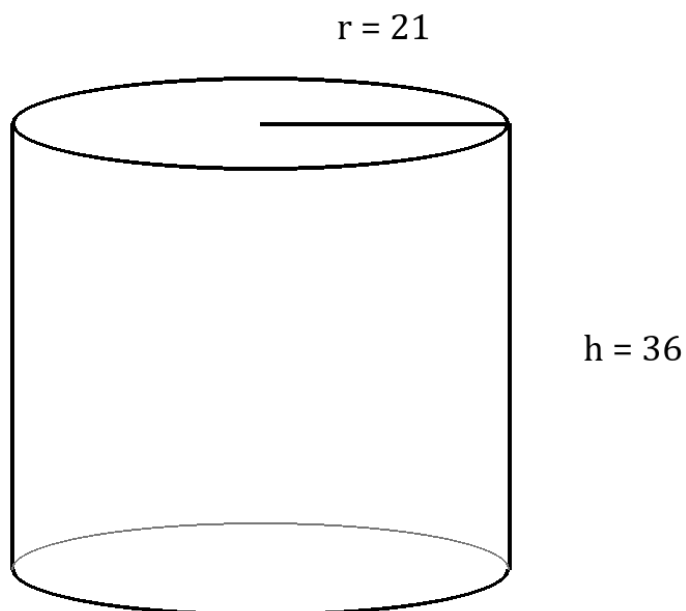


- (i) Find the perimeter.
- (ii) Find the semi-perimeter.
- (iii) (A) Explain why the triangle is right-angled and hence find its area.

OR

- (iii) (B) Use Heron's formula to find its area.

37. A craft group makes a closed cylindrical storage box. In figure, its radius is 21 cm and its height is 36 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. Tiwari Academy combines the results of two practice groups. Group A has 27 students with mean score 67; Group B has 32 students with mean score 77. 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 82. Find the new mean of Group B.