

Mathematics — Ganita Manjari

Sample Question Paper 1

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. Without performing division, determine whether the decimal expansion of $\frac{18}{125}$ is terminating or non-terminating. If it terminates, state the number of decimal places.

- (A) Terminating; 2 places
- (B) Terminating; 3 places
- (C) Terminating; 4 places
- (D) Non-terminating

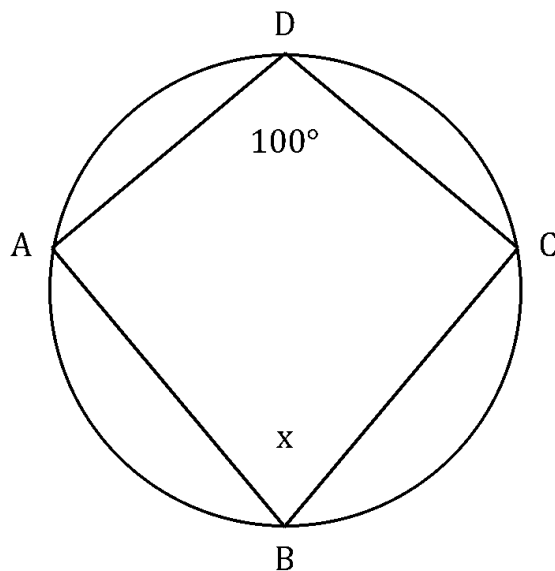
2. What is the coefficient of z in the polynomial $4z^3 + 5z^2 - 11$?

- (A) 4
- (B) 5
- (C) -11
- (D) 0

3. What are the x-coordinate and y-coordinate of the point of intersection of the two axes?

- (A) 0 and 0
- (B) 1 and 0
- (C) 0 and 1
- (D) 1 and 1

4. In figure, find x.



- (A) 100°
(C) 80°

- (B) 70°
(D) 90°

5. The volume of a cube is 64 cm^3 . What is its total surface area?

- (A) 16 cm^2
(C) 64 cm^2

- (B) 96 cm^2
(D) 384 cm^2

6. The probability of an event that is certain to happen is _____.

- (A) 0
(C) 1

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

7. If a number plus its reciprocal equals $\frac{10}{3}$, find the number.

- (A) 3 or $\frac{1}{3}$
(B) 2 or $\frac{1}{2}$
(C) -3 or $-\frac{1}{3}$
(D) 10 or $\frac{1}{10}$

8. Find the 12th term of a GP with common ratio 2, whose 8th term is 192.

- (A) 768
(C) 6144

- (B) 1536
(D) 3072

9. The edge of a cube measures r cm. The largest possible right circular cylinder is cut out of the cube. What do you think is the volume of the cylinder (in cm^3)?

(A) πr^3

(B) $\frac{\pi r^3}{4}$

(C) $\frac{\pi r^3}{2}$

(D) $\frac{\pi r^3}{3}$

10. Why is it important to align the columns from right to left?

(A) To place the larger number first

(B) To avoid every carry

(C) To add digits of equal place value

(D) To reverse the digits

11. The ramp at a loading dock rises 2.5 metres over a run of 4 metres. Find the slope of the ramp.

(A) $\frac{5}{8}$

(B) $\frac{8}{5}$

(C) $\frac{3}{2}$

(D) 10

12. Find the value using a suitable identity: 17×21 .

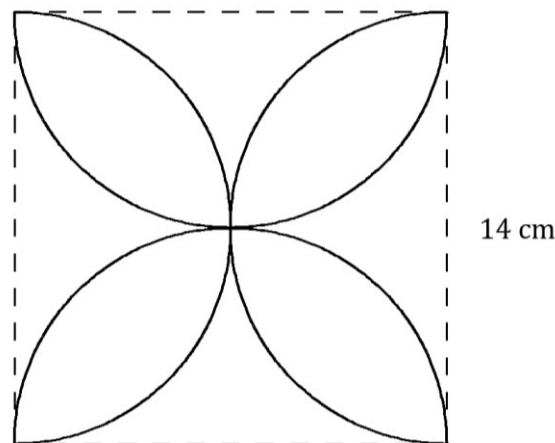
(A) 347

(B) 367

(C) 377

(D) 357

13. Find the total perimeter of all the petals in the given flower.



The centres of the arcs are the midpoints of the sides of the square.

(A) 44 cm

(B) 88 cm

(C) 56 cm

(D) 176 cm

14. Find the value of the following polynomial at the indicated value of the variable.

$5x^2 - 3x + 7$ if $x = 1$

(A) 15

(B) 5

(C) 9

(D) -1

15. A bag has 3 candies: strawberry, lemon and mint. One is picked at random. What is the probability of picking a strawberry candy?

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

16. Which term of the sequence $2, 2\sqrt{2}, 4, \dots$ is 128?

- (A) 7th (B) 12th
(C) 14th (D) 13th

17. The diameter of the moon is approximately one fourth the diameter of the earth. Given that the moon and earth are both roughly spherical, find the ratio of their surface areas.

- (A) 1 : 16 (B) 1 : 4
(C) 1 : 8 (D) 1 : 64

18. If $a - b = 5$ and $ab = 6$, what is the value of $a^2 + b^2$?

- (A) 13 (B) 31
(C) 37 (D) 49

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): When two fair coins are tossed independently, the probability of exactly one head is $\frac{1}{2}$.

Reason (R): The four equally likely outcomes are HH, HT, TH and TT and exactly two of them contain one head.

20. Assertion (A): Every rectangle with equal diagonals is a square.

Reason (R): The diagonals of every square are equal.

SECTION B

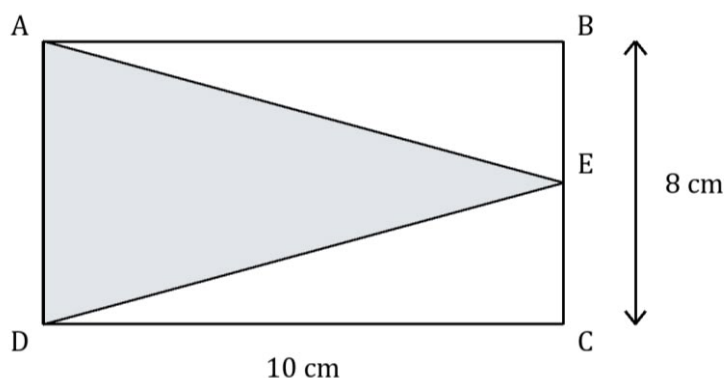
(5 questions $\times$ 2 marks = 10 marks)

21. (A) Are the points M $(-3, -4)$, A $(0, 0)$ and G $(6, 8)$ on the same straight line? Suggest a method to check this without plotting and joining the points.

OR

(B) Find the length of the chord of a circle where the radius is 7 cm and perpendicular distance is 6 cm.

22. In figure, find the area of triangle ADE.



23. Compute the following greatest common divisor using the improved version of Euclid's algorithm. gcd (375, 825)

24. (A) Find the 10th and 26th terms of the AP: 3, 8, 13, 18, ...

OR

(B) The height of a cone is 16 cm, and its base radius is 12 cm. Find the curved surface area and the total surface area of the cone.

25. Proposition P: If two triangles have the same area, then they are congruent.

Converse Q: If two triangles are congruent, then they have the same area.

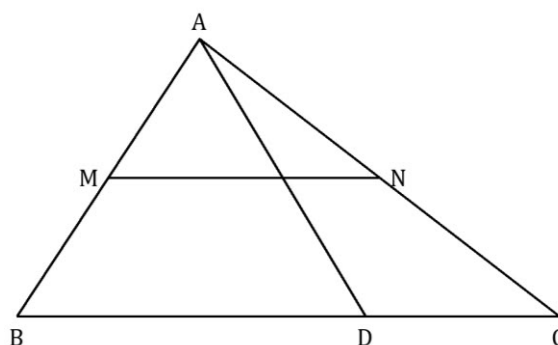
Determine if these statements are true or not. Justify the true statements and give a counterexample for each false statement.

SECTION C

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

26. Prove that $\sqrt{5}$ is an irrational number.

27. In $\triangle ABC$, let M and N be midpoints of AB and AC respectively. Let D be any point on BC. Show that MN bisects AD.



28. (A) By factoring the expression, check that $n^3 - n$ is always divisible by 6 for all natural numbers n. Give reasons.

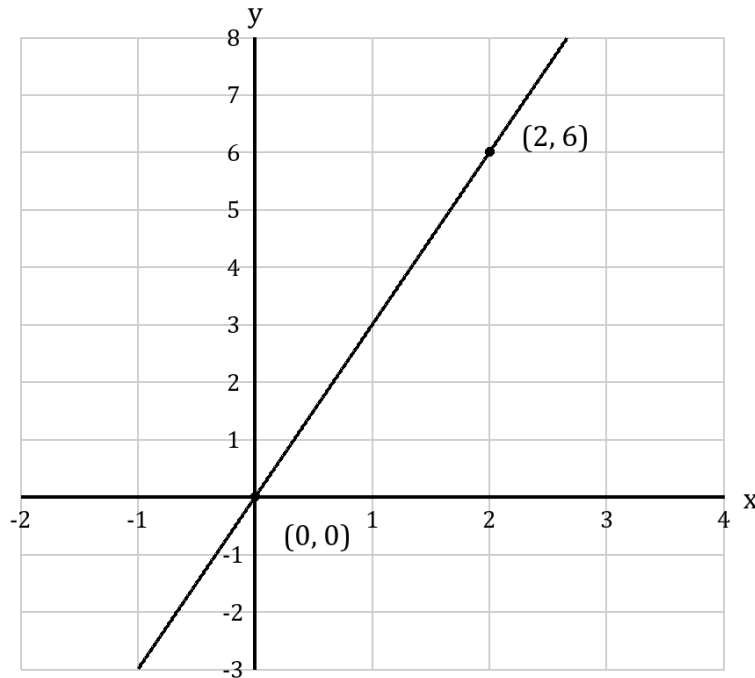
OR

(B) If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that

$$a^3 + b^3 + c^3 - 3abc = -25.$$

29. The average score of students on a test in Section A is 72 and that of students in Section B is 76. What is the combined average of both the sections given that Section A has 30 students and Section B has 25 students?

30. The graph of the line $y = 3x$, passing through $(0, 0)$ and $(2, 6)$ is given below.



(i) Identify the slope of the line from the graph and explain how you calculated it using the two points on the line.

(ii) What is the y-intercept of the line? Explain its significance.

(iii) Without drawing a new graph, determine whether the point $(4, 10)$ lies on this line. Justify your answer.

31. (A) There are two fruit baskets A and B. Basket A has one apple and two oranges. Basket B has one banana and one mango. You randomly pick one fruit from each basket.

(i) Draw a tree diagram showing all possible pairs of fruits.

(ii) List the sample space.

(iii) What is the probability of picking one apple and one banana?

OR

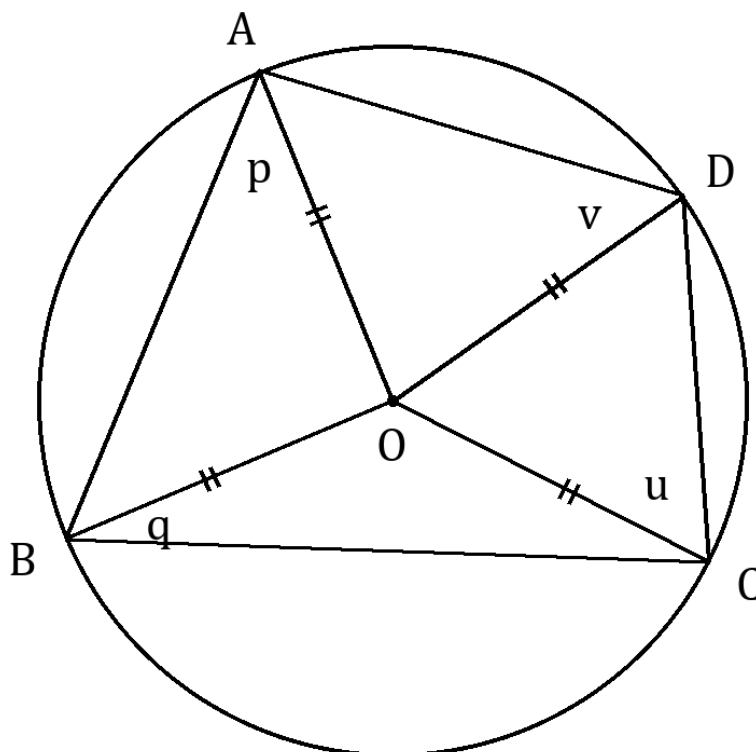
(B) A right triangle with sides 6 cm, 8 cm and 10 cm is rotated through 360° about the side of 8 cm. Find the volume and the curved surface area of the solid so formed.

SECTION D

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

32. The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them manages to save ₹2000 per month, find their monthly incomes.

33. How would you use the following figure to justify the statement that the sum of the opposite angles of a cyclic quadrilateral is 180° ?



34. (A) The graph of a linear polynomial $p(x)$ passes through the points (1, 5) and (3, 11).

(i) Find the polynomial $p(x)$.

(ii) Find the coordinates where the graph of $p(x)$ cuts the axes.

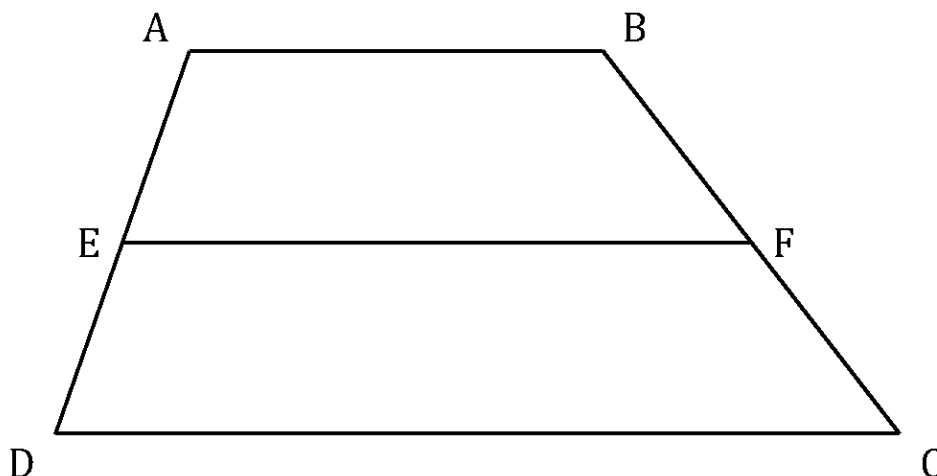
(iii) Draw the graph of $p(x)$ and verify your answers.

OR

(B) Plot the points A (2, 1), B (-1, 2), C (-2, -1), and D (1, -2) in the coordinate plane. Is ABCD a square?

Can you explain why? What is the area of this square?

35. (A) A more general midpoint theorem and its converse. In a quadrilateral ABCD, suppose $AB \parallel DC$. Recall that such ABCD is called a trapezium. Let E be the midpoint of AD. A line drawn through E intersects side BC at F.



(i) If $EF \parallel AB$, then show that F is the midpoint of BC.

Conclude that $EF = \frac{AB+CD}{2}$.

(ii) If F is the midpoint of BC, then show that $EF \parallel AB$.

OR

(B) A cube of side 5 cm is painted on all its faces. If it is sliced into 1 cm^3 cubes, how many of these 1 cm^3 cubes have

- (i) exactly three faces painted?
- (ii) exactly two faces painted?
- (iii) exactly one face painted?
- (iv) no face painted?

SECTION E

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

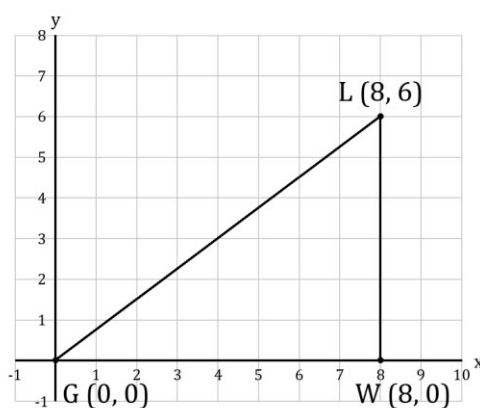
36. Tiwari Academy conducts a practice quiz for six Class 9 students. Their scores, out of 25, are 12, 14, 14, 16, 18 and 22. The teacher uses the results to discuss measures of central tendency.

- (i) Find the mode of the scores.
- (ii) Find the median score.
- (iii) (A) Calculate the mean score of the six students.

OR

(iii) (B) A seventh student takes the same quiz and scores 23. Calculate the mean score of all seven students.

37. A school maps a triangular walking route on a coordinate grid. The gate is G (0, 0), a water point is W (8, 0), and the library is L (8, 6). Each grid unit represents 1 metre.

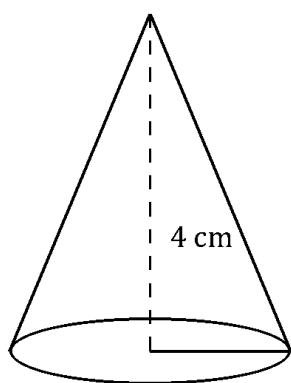


- (i) Find the distance GW.
- (ii) Find the distance WL.
- (iii) (A) Find the direct distance GL and the perimeter of the triangular route.

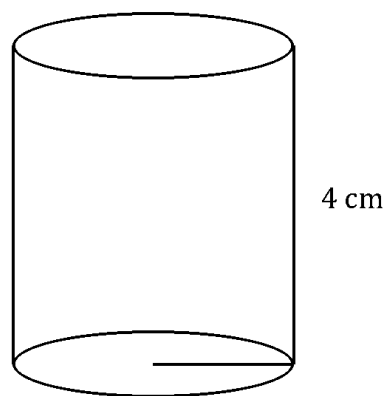
OR

- (iii) (B) A bench is placed halfway along GL. Find its coordinates and its distance from G.

38. For a mathematics exhibition, students make a right circular cone and a right circular cylinder. Each has base radius 3 cm and height 4 cm, as shown. Express areas and volumes in terms of π .



3 cm
Cone



3 cm
Cylinder

- (i) Find the slant height of the cone.
- (ii) State the ratio of the volume of the cone to that of the cylinder.
- (iii) (A) Find the curved surface area and the total surface area of the cone.

OR

- (iii) (B) Find the volume of the cone and the sum of the volumes of the two solids.