

Mathematics — Ganita Manjari

Sample Question Paper 10

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. Compute $\gcd(51000, 81000)$ using the improved version of Euclid's algorithm.

- | | |
|----------|----------|
| (A) 3001 | (B) 3000 |
| (C) 2999 | (D) 3002 |

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

- | | |
|--|--------------------------------------|
| (A) Yes for every positive integer n | (B) No; $n = 12$ is a counterexample |
| (C) No; $n = 24$ is a counterexample | (D) Yes; $4 \times 6 = 24$ |

3. How many multiples of 4 lie between 10 and 250?

- | | |
|--------|--------|
| (A) 61 | (B) 59 |
| (C) 60 | (D) 62 |

4. Find the 10th triangular number.

- | | |
|--------|--------|
| (A) 56 | (B) 55 |
| (C) 57 | (D) 54 |

5. What is the probability of getting an even number when rolling a fair 6-sided die?

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

6. In a circle, a chord is 5 cm away from the centre. If the radius of the circle is 13 cm, what is the length of the chord?

(A) 10 cm

(B) 26 cm

(C) 24 cm

(D) 12 cm

7. Find the value of 299^2 using a suitable identity.

(A) 89401

(B) 89403

(C) 89400

(D) 89402

8. Find the value of the linear polynomial $5x - 3$ if $x = 2$.

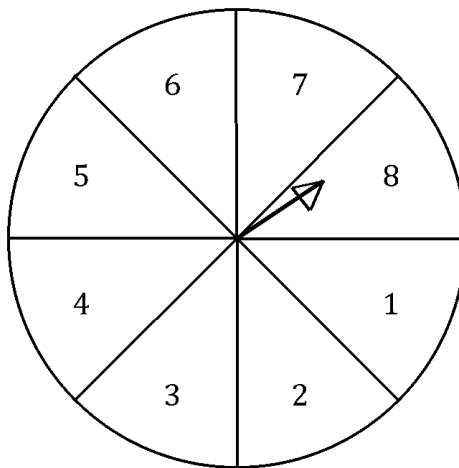
(A) 6

(B) 9

(C) 8

(D) 7

9. 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 less than 9?



(A) 1

(B) $\frac{7}{8}$

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

(D) 0

10. Find the value of the quadratic polynomial $7s^2 - 4s + 6$ if $s = 0$.

(A) 8

(B) 5

(C) 7

(D) 6

11. 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) 4

(C) 1

(D) 2

12. 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

13. In a T20 match, a team scored 6 runs in the first over. In the second over they scored 12 runs. What is the run rate now?

- (A) 11 (B) 10
(C) 8 (D) 9

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

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

15. If $x - y = 13$ and $xy = 11$, find $x^2 + y^2$.

- (A) 189 (B) 169
(C) 193 (D) 191

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

- (A) 6242 (B) 6241
(C) 6243 (D) 6240

17. Give a formula to find the x -intercept of the line $y = mx + c$, where $m \neq 0$.

- (A) $\frac{c}{m}$ (B) mc
(C) $-\frac{m}{c}$ (D) $-\frac{c}{m}$

18. Find the value of 193^2 using a suitable identity.

- (A) 37248 (B) 37249
(C) 37251 (D) 37250

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 $(12, 38)$ 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 144 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)

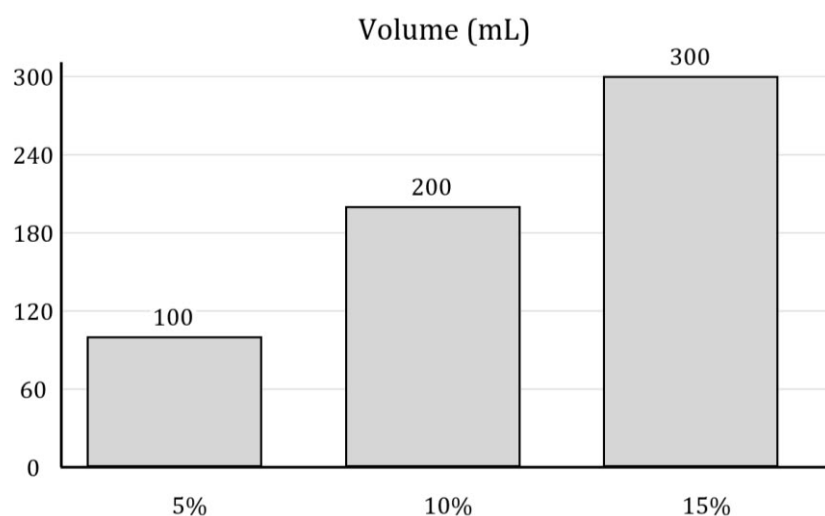
21. The radius of a sphere is increased by 10%. Show that the volume increases by approximately 33.1%.

22. (A) Suppose you roll a 6-sided die 12 times and get a '3' three times. (i) What is the experimental probability of rolling a '3'? (ii) What is the theoretical probability of rolling a '3'?

OR

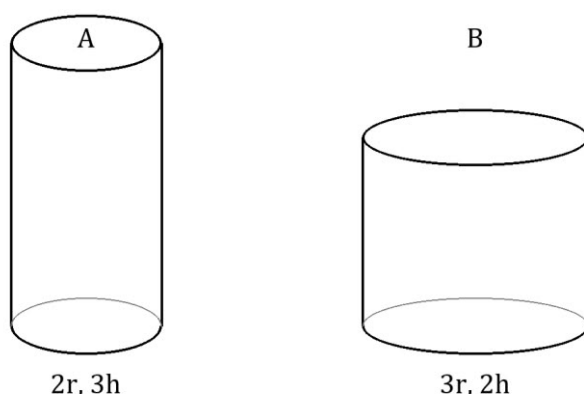
(B) What would a system of coordinates be like if we did not have negative numbers? Would this system allow us to locate all the points on a 2-D plane?

23. Calculate the concentration of spice mix when a 100 mL kashayam/kadha with 5% spice mix, a 200 mL one with 10% spice mix, and a 300 mL one with 15% spice mix are combined.



24. Convert $\frac{2}{9}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

25. (A) The radii of two cylinders are in the ratio 2 : 3, and their heights are in the ratio 3 : 2. Find (a) the ratio of their volumes, and (b) the ratio of their curved surface areas.



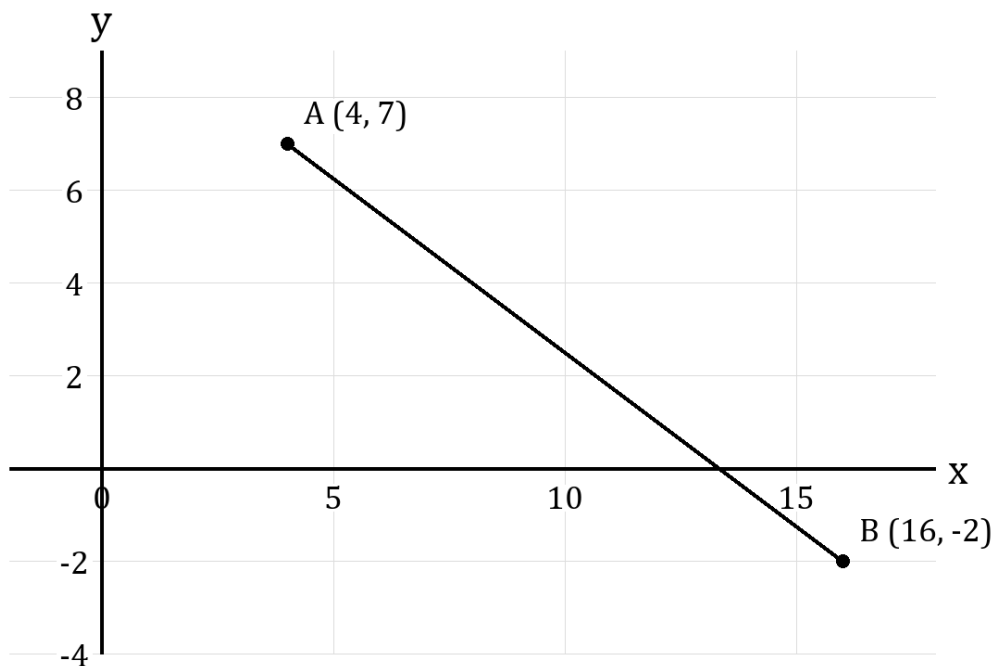
OR

(B) If the wheel of a bicycle has a diameter of 60 cm, find how far a cyclist will have travelled after the wheel has rotated 100 times.

SECTION C

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

26. (A) Let P, Q be points of trisection of AB, with P closer to A, and Q closer to B. Using your knowledge of how to find the coordinates of the midpoint of a segment, how would you find the coordinates of P and Q? Do this for the case when the points are A (4, 7) and B (16, -2).



OR

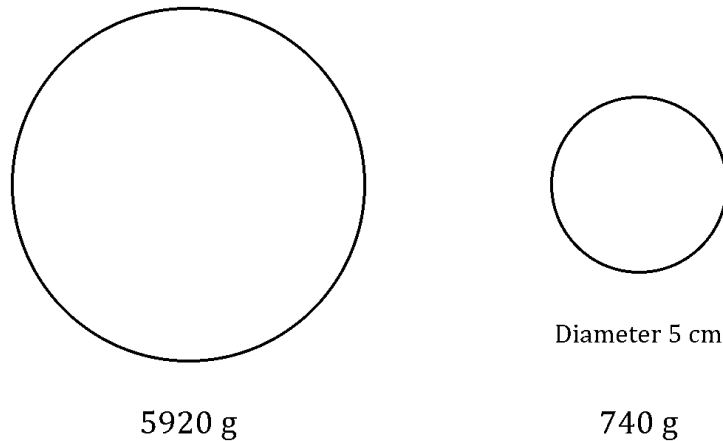
(B) A regular hexagon is inscribed in a circle of radius r . Find the length of the sides of the hexagon and the distance of each side from the centre of the circle.

27. (A) A rectangular pool is such that its breadth is 4 metres less than its length and its area is 96 sq. metres. Find the length and breadth of the pool.

OR

(B) A stationery shop owner made ₹8000 selling books, of which 30% is the profit amount, and ₹1000 selling book covers, of which 50% is the profit amount. What is the percentage of profit on the total sales?

28. 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.



29. 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 .

30. Compute $\gcd(1789287, 237656)$ using the improved version of Euclid's algorithm.

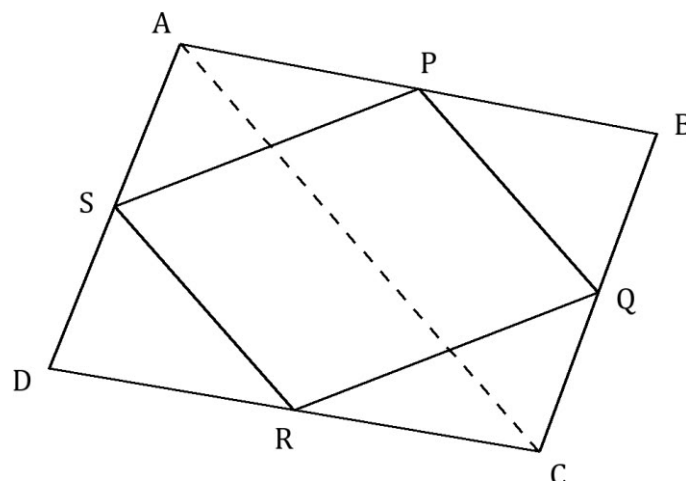
31. Which term of the GP: 2, 8, 32, ... is 131072? Write the explicit formula as well as the recursive formula for the n th term.

SECTION D

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

32. Solve the following system of equations graphically: $2x + y = 6$, $2x - y - 2 = 0$.

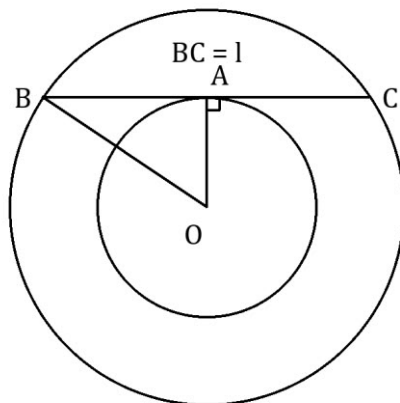
33. (A) Prove that the midpoints of the sides of a quadrilateral form a parallelogram.



OR

(B) 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?

34. 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 $\frac{1}{4}\pi l^2$.



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

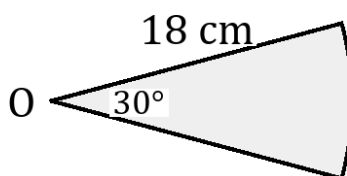
OR

(B) Prove that the segment joining the midpoints of two sides of a triangle is parallel to the third side and half of it.

SECTION E

(3 questions $\times$ 4 marks = 12 marks) | Each question: 1 + 1 + 2 marks

36. A circular display has radius 18 cm. A coloured sector subtends 30° at the centre O, as shown in figure. Express lengths and areas in terms of π .



- (i) What fraction of the circle is coloured?
- (ii) Find the angle of the uncoloured sector.
- (iii) (A) Find the coloured area and the length of its arc.

OR

- (iii) (B) Find the uncoloured area and the perimeter of the coloured sector.

37. A printing service prepares practice booklets for Tiwari Academy. Its charge is a fixed setup fee of ₹50 plus ₹14 per booklet. If x booklets are ordered, the total charge is represented by $C(x)$.

(i) Write the linear polynomial $C(x)$.

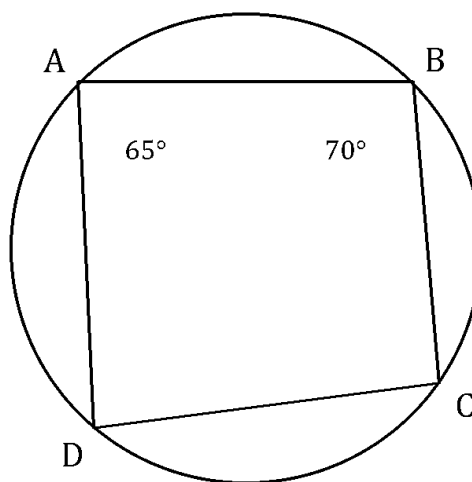
(ii) Find $C(0)$ and explain its meaning.

(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 ₹386. How many booklets were ordered?

38. A designer draws a cyclic quadrilateral ABCD for a circular mosaic. In figure, $\angle A = 65^\circ$ and $\angle B = 70^\circ$. The four vertices lie on the circle.



(i) Find $\angle C$.

(ii) Find $\angle D$.

(iii) (A) Verify numerically that both pairs of opposite angles are supplementary.

OR

(iii) (B) AB is extended beyond B to E. Find $\angle CBE$ and explain its relation to $\angle D$.