

Mathematics — Ganita Manjari

Sample Question Paper 9

Class IX | 2026–27

Time Allowed: 3 Hours

Maximum Marks: 80

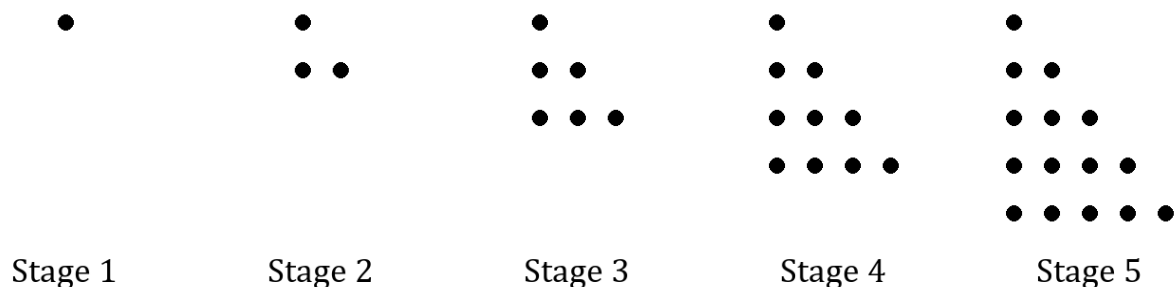
General Instructions

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

2. An isosceles triangle has base 10 cm, and its area is 60 cm^2 . What are the lengths of the equal sides?

- (A) 12 cm each (B) 10 cm each
(C) 15 cm each (D) 13 cm each

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

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

4. The number 0.99999... is exactly equal to _____.

- (A) 0.9 (B) 1
(C) 0.999 (D) 0.99

5. A circle has a radius of 15 cm. A chord is drawn. The distance from the centre of the circle to the chord is 9 cm. What is the length of the chord?

- (A) 30 cm (B) 24 cm
(C) 18 cm (D) 12 cm

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

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

7. The set of all possible outcomes of a random experiment is called the _____.

- (A) frequency (B) event
(C) sample space (D) relative frequency

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

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

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

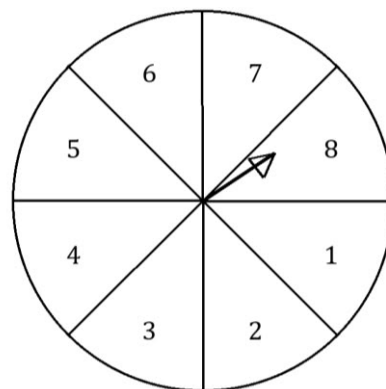
- (A) 1218815 (B) 1218816
(C) 1218817 (D) 1218818

10. Compute $\gcd(99, 2)$ using the improved version of Euclid's algorithm.

- (A) 4 (B) 5
(C) 1 (D) 3

11. 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) $\frac{5}{8}$
(B) $\frac{1}{8}$
(C) $\frac{1}{2}$
(D) $\frac{3}{8}$



12. 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, CD; opposite: BC
(C) Adjacent: AC, BD; opposite: CD (D) Adjacent: AD, BC; opposite: CD

13. Find the value of $(-299)^3$ using a suitable identity.

- (A) -26730897 (B) -26730899
(C) -26730900 (D) -26730898

14. If $x - y = 12$ and $xy = 10$, find $x^2 + y^2$.

- (A) 162 (B) 144
(C) 164 (D) 166

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; equal angles imply equal sides
(D) Yes; all rectangles are squares

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

- (A) 8 (B) 5
(C) 6 (D) 7

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

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

18. Is 1, -1, 1, -1, 1, ... a geometric progression? If so, what is the common ratio?

- (A) Yes; 4 (B) Yes; 1
(C) No (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 (11, 25) 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 121 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.

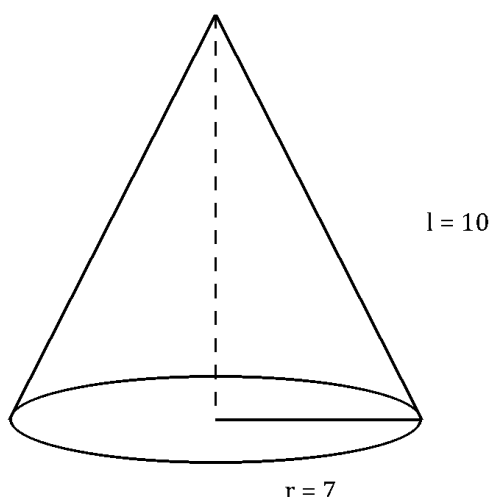
SECTION B

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

- 21.** A rectangular pool has area $2x^2 + 7x + 3$ square hastas. If its width is $2x + 1$ hastas, find its length. Hasta was a unit used to measure length.
- 22.** Execute the algorithm to compute the divisors of 775.
- 23. (A)** Find the 31st term of an AP whose 11th term is 38 and 16th term is 73.

OR

- (B)** Point W has x-coordinate equal to -5 . Can you predict the coordinates of point H which is on the line through W parallel to the y-axis? Which quadrants can H lie in?
- 24.** Find the curved surface area of a right circular cone whose slant height is 10 cm and base radius is 7 cm.



- 25. (A)** The radius of a sphere is increased by $x\%$. The volume of the sphere increases by 72.8% . Find the value of x .

OR

- (B)** 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.

SECTION C

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

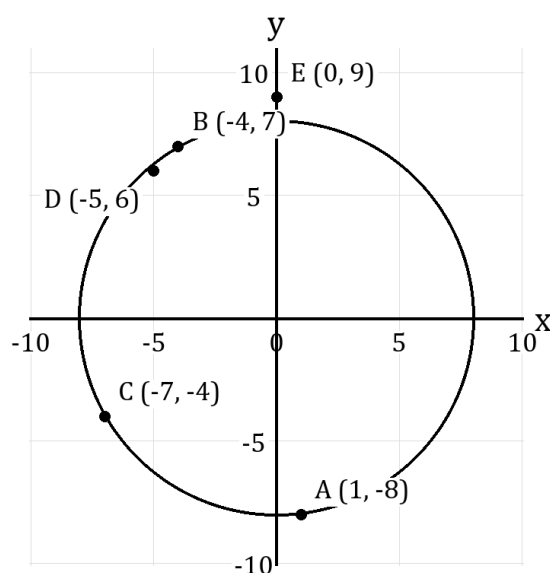
- 26. (A)** The digits of a two-digit number differ by 3. If the digits are interchanged, and the resulting number is added to the original number, we get 143. Find both the numbers.

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?

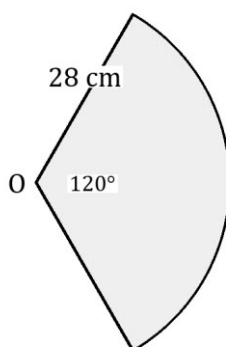
27. Three rational numbers x, y, z satisfy $x + y + z = 0$ and $xy + yz + zx = 0$. Show that all the rational numbers x, y, z must be simultaneously zero.

28. Given the points $A (1, -8)$, $B (-4, 7)$ and $C (-7, -4)$, show that they lie on a circle K whose centre is the origin $O (0, 0)$. What is the radius of circle K ? Given the points $D (-5, 6)$ and $E (0, 9)$, check whether D and E lie within the circle, on the circle, or outside the circle K .



29. 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.

30. A car has two wipers which do not overlap. Each wiper has a blade of length 28 cm and sweeps through an angle of 120° . Find the total area cleaned at each sweep of the blades.



31. (A) 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.

OR

(B) Assume that $m \geq n > 0$. Verify that d divides m and n if and only if d divides both n and $m \bmod n$.

SECTION D

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

32. (A) A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid ₹27 for a book kept for seven days, while Susy paid ₹21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.

OR

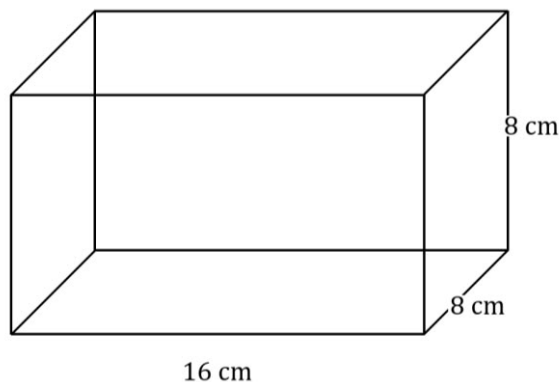
(B) A train moving with uniform speed for a certain distance takes 6 hours less if its speed is increased by 6 km/hour. It would have taken 6 hours more had its speed been decreased by 4 km/hour. Find the distance travelled and the speed of the train.

33. (A) Suppose the midpoints of sides AB, BC, CD and DA of a quadrilateral ABCD are P, Q, R and S respectively. (i) Show that PR and QS bisect each other. (ii) Show that if $AC = BD$, then PR and QS are perpendicular. Is the converse true?

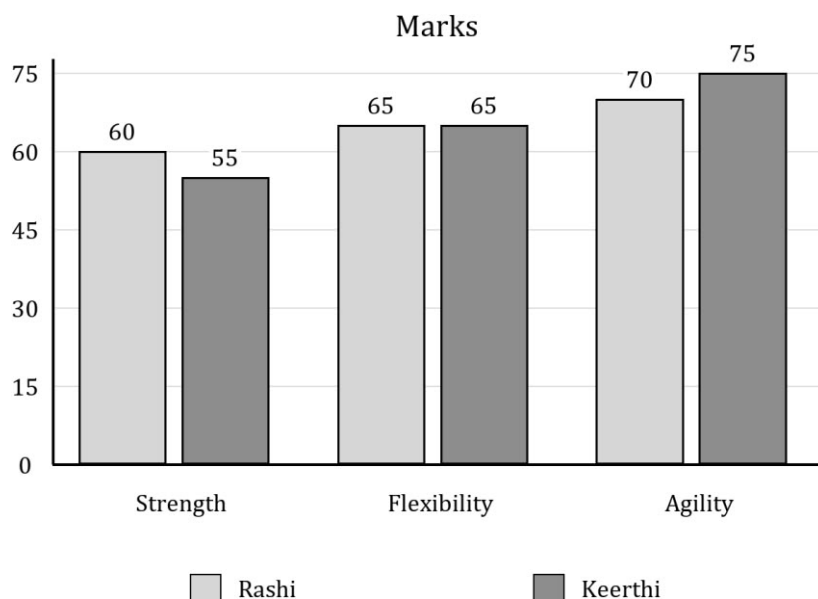
OR

(B) If we add 1 to the numerator and subtract 1 from the denominator, a fraction reduces to 1. It becomes equal to $\frac{1}{2}$ if we add 1 only to the denominator. What is the fraction?

34. Metal spheres, each of radius 2 cm, are packed into a rectangular box of internal dimensions 16 cm $\times$ 8 cm $\times$ 8 cm. When 16 spheres are packed, the box is filled with preservative liquid. Find the volume of this liquid. Round your answer to the nearest integer.



35. A physical fitness evaluation is being undertaken. The final marks are calculated by combining the marks for strength, flexibility, and agility in the ratio 4 : 5 : 6. Rashi has scored 60, 65, and 70. Keerthi has scored 55, 65, and 75 respectively. (i) Find out whose total is more without calculating. (ii) What are their final marks?



SECTION E

(3 questions × 4 marks = 12 marks)

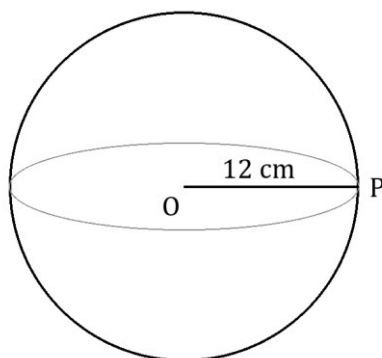
36. For a probability activity, Tiwari Academy puts 11 red counters and 14 blue counters of the same size in a bag. A student draws a counter at random, replaces it, and mixes the bag before drawing again.

- (i) How many counters are in the bag?
- (ii) Find the probability of red on the first draw.
- (iii) (A) Find the probability that both counters drawn are red.

OR

- (iii) (B) Find the probability of drawing one red and one blue counter in either order.

37. A spherical model of radius 12 cm is made for an exhibition. In figure, O is its centre and P lies on its surface. Give answers in terms of π .

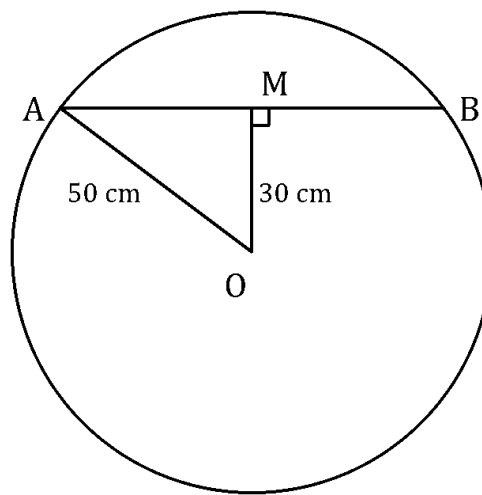


- (i) Find OP.
- (ii) Find the diameter.
- (iii) (A) Find its surface area and volume.

OR

- (iii) (B) The model is cut into two hemispheres. Find the curved surface area and total surface area of one hemisphere.

38. A circular window has centre O and radius 50 cm. A straight decorative strip AB is a chord. The perpendicular OM from O to AB measures 30 cm, as shown in figure.



- (i) State the relation between AM and MB.
- (ii) Find $\angle OMB$.
- (iii) (A) Find AM and the full length AB.

OR

- (iii) (B) Find the area and perimeter of triangle OAB.