

Mathematics — Ganita Manjari

Sample Question Paper 7

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. Factor completely: $49x^2 + 28xy + 4y^2$.

(A) $(7x - 2y)^2$

(B) $(7x + 2y)^2$

(C) $(49x + 2y)^2$

(D) $(7x + 4y)^2$

2. Find the value of $(-107)^3$ using a suitable identity.

(A) -1225044

(B) -1225042

(C) -1225043

(D) -1225041

3. Find S_{1000} , the sum of the first 1000 natural numbers.

(A) 500500

(B) 500502

(C) 500499

(D) 500501

4. What is the x-coordinate of a point on the y-axis?

(A) 1

(B) 0

(C) Any non-zero number

(D) -1

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

(A) 3

(B) 1

(C) 4

(D) 5

6. A cube of side 4 cm is cut into cubes of side 1 cm. What is the ratio of the surface areas of the original cube and all the cut-out cubes?

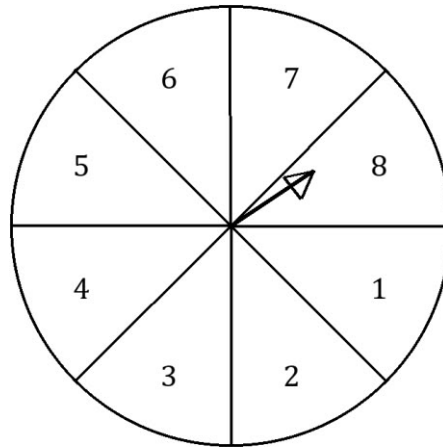
(A) 4 : 1

(B) 1 : 16

(C) 1 : 64

(D) 1 : 4

7. 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?



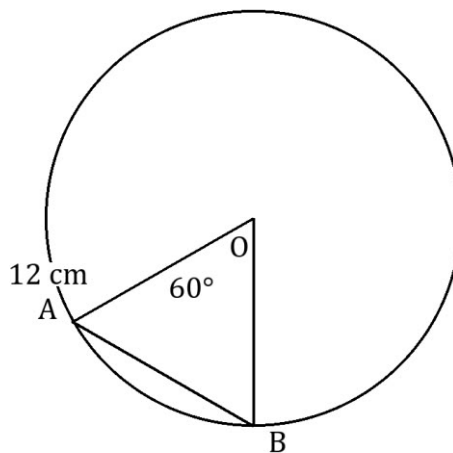
(A) 1

(B) 0

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

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

8. 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) 6 cm

(B) 12 cm

(C) 18 cm

(D) 24 cm

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

(A) 45°

(B) 90°

(C) 60°

(D) 180°

10. If $x - y = 10$ and $xy = 8$, find $x^2 + y^2$.

- (A) 100 (B) 116
(C) 118 (D) 114

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

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

12. If a number is a multiple of 6, then it is a multiple of 3. Is the converse true?

- (A) No; 6 is a counterexample
(B) No; 3 is a counterexample
(C) Yes; 3 divides 6
(D) Yes; every multiple of 3 is a multiple of 6

13. Find the degree of the following polynomial: $y^3 + 2y - 1$.

- (A) 1 (B) 0
(C) 3 (D) 2

14. 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) 24 cm
(C) 26 cm (D) 12 cm

15. Find the value using a suitable identity: 104×96 .

- (A) 9984 (B) 9983
(C) 9985 (D) 9986

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

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

17. Find S_{20} , the sum of the first 20 natural numbers.

- (A) 212 (B) 209
(C) 211 (D) 210

18. The probability of an impossible event is _____.

- (A) $\frac{1}{2}$ (B) 0
(C) -1 (D) 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 (9, 21) 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 81 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.

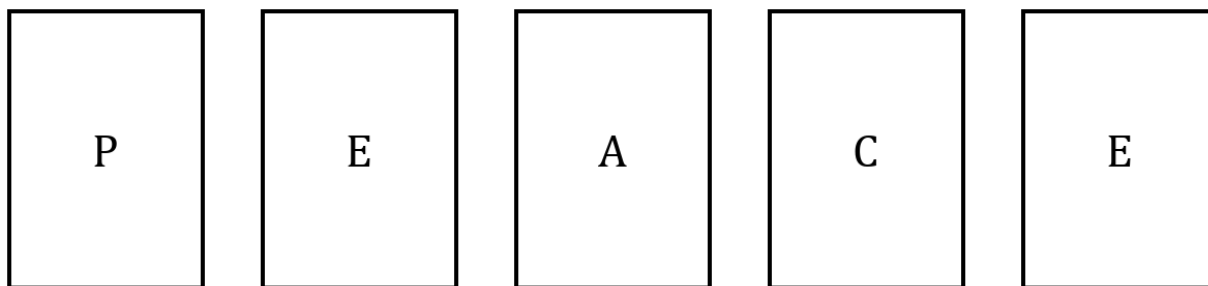
SECTION B

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

21. Ruby has 3 times as many two-rupee coins as she has five-rupee coins. If she has a total ₹88, how many coins does she have of each type?

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

23. (A) The letters of the word 'PEACE' are placed on cards. Leela draws a card without looking. (i) What is the probability that it is a P, E or C? (ii) What is the probability that it is not an E?



OR

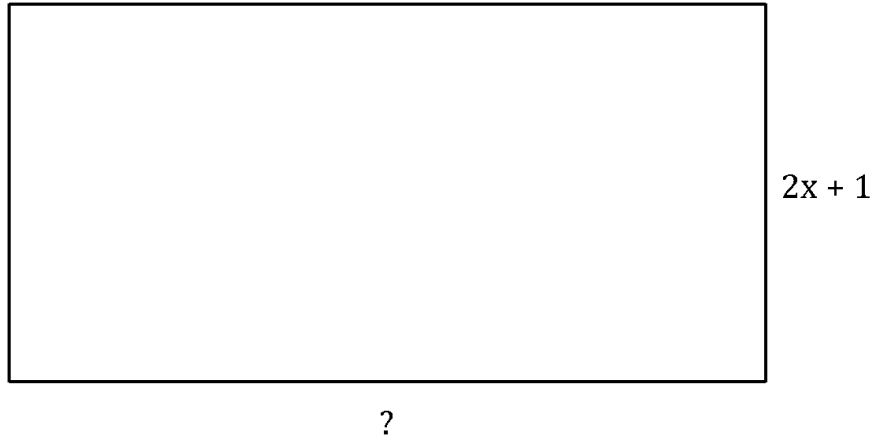
(B) A white stork's migration is tracked. The average daily distance travelled, calculated over 20 days, is 44.5 km. On the 21st day, it flew 55 km. What is the average daily distance travelled over these 21 days? Make a guess before you calculate.

24. (A) If $\frac{x}{3} + \frac{x}{5} = \frac{16}{15}$, find the rational number x.

OR

(B) A goldsmith melts together three pieces of gold: 9 units at 12 varṇa, 5 units at 10 varṇa, and 17 units at 11 varṇa. Find the purity in varṇa of the combined gold.

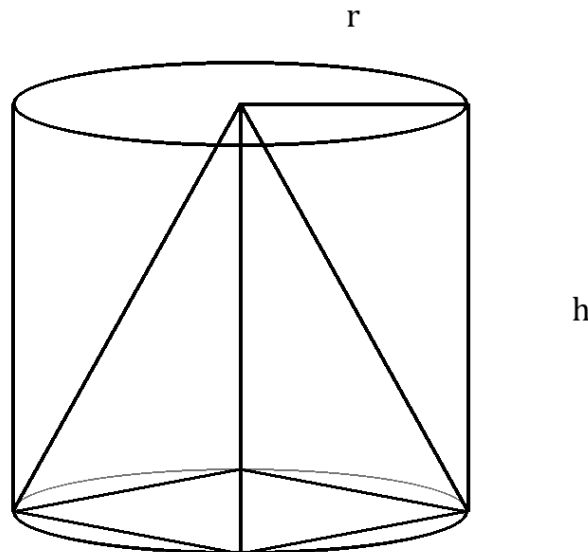
25. A rectangular pool has area $2x^2 + 7x + 3$ square hastas. If its width is $2x + 1$ hastas, find its length. Hasta was a unit used to measure length.



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) 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 .

OR

(B) Write an algorithm prime divisors(n) to compute the list of divisors of n that are prime numbers.

28. A pool 30 *hastas* long is dug to different depths along its length. It is divided into 5 sections having lengths 4, 5, 6, 7 and 8 *hastas*, and is dug to depths of 9, 7, 7, 3, and 2 *hastas*, respectively. Find the mean depth of the pool.

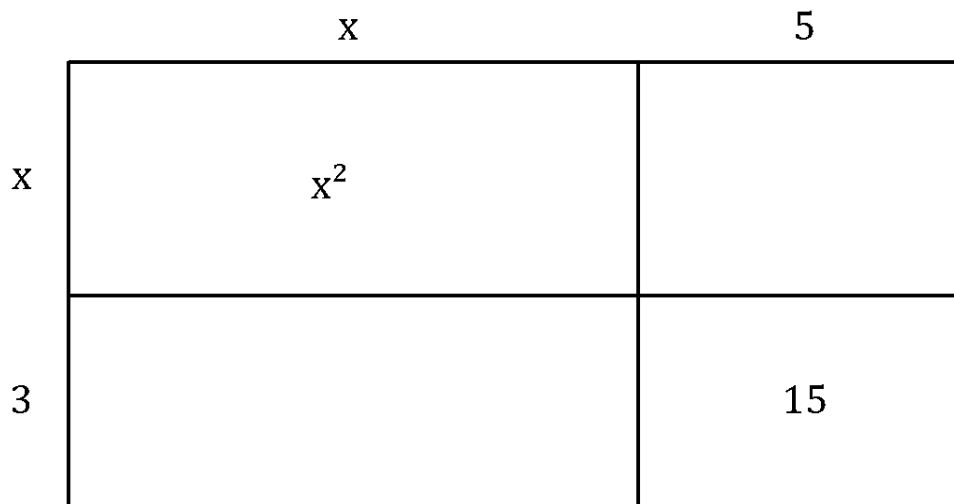
29. (A) If the 4th, 10th and 16th terms of a GP are x , y and z respectively, prove that x , y , z are in GP.

OR

(B) Check if the points R $(-5, -1)$, B $(-2, -5)$ and C $(4, -12)$ are on the same straight line. Now plot the points and check your answer.

30. A sequence is given by the recursive rule $t_1 = 2$, $t_{n+1} = 3t_n - 2$ for $n \geq 1$. Which term of the sequence is 730?

31. Saira has arranged a square of side x units, 8 rectangular strips of sides x units and width 1 unit, and 15 squares of side 1 unit to form a bigger rectangle. Find the length and breadth of the rectangle in terms of x .



SECTION D

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

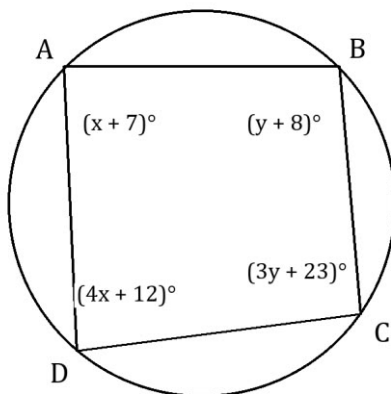
32. Suppose the Earth is perfectly spherical. A string is wrapped tightly around its equator. Another string, 1 metre longer, forms a larger circle, staying the same distance above the ground everywhere. How high above the ground is the second string? Repeat this for (i) the Moon (ii) Jupiter (iii) a volleyball. Are you surprised by the three answers? Why or why not?

33. (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) An equilateral triangle is inscribed in a circle of radius r . Show that the ratio of the area of the triangle to the area of the circle is $\frac{3\sqrt{3}}{4\pi}$.

34. In a cyclic quadrilateral ABCD, $\angle A = (x + 7)^\circ$, $\angle B = (y + 8)^\circ$, $\angle C = (3y + 23)^\circ$ and $\angle D = (4x + 12)^\circ$. Find all four angles of the cyclic quadrilateral.



35. (A) A square is inscribed in a circle of radius r . Show that the ratio of the area of the square to the area of the circle is $\frac{2}{\pi}$.

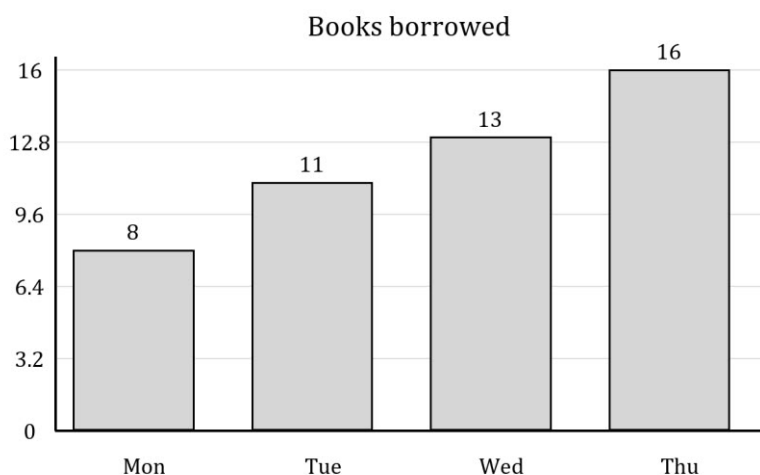
OR

(B) 5 pencils and 7 pens together cost ₹50, whereas 7 pencils and 5 pens together cost ₹46. Find the cost of each pencil and pen.

SECTION E

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

36. 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, 17 books are borrowed. Find the new mean for all five days.

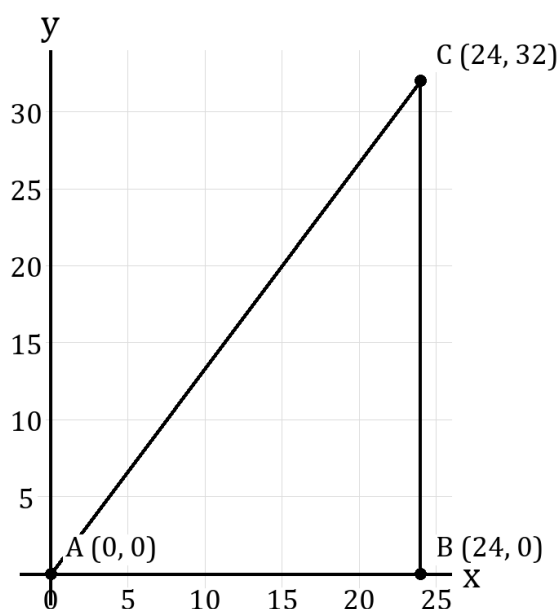
37. Tiwari Academy combines the results of two practice groups. Group A has 17 students with mean score 57; Group B has 22 students with mean score 67. All students took the same test.

- (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 72. Find the new mean of Group B.

38. A school survey marks three points on a square coordinate grid: A (0, 0), B (24, 0) and C (24, 32). One grid unit represents one metre. The path A–B–C follows two perpendicular sides of the school garden.



- (i) Find the length AB.
- (ii) Find the length BC.
- (iii) (A) Calculate the direct distance AC and the perimeter of triangle ABC.

OR

- (iii) (B) Find the coordinates of the midpoint M of AC and its distance from A.