

Mathematics — Ganita Manjari

Sample Question Paper 14

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.

SECTION A

(20 questions × 1 mark = 20 marks)

1. Find S_{50} , the sum of the first 50 natural numbers.

(A) 1276 (B) 1277
(C) 1274 (D) 1275

2. Suppose you have a cup in the shape of a right circular cone. Fill it with water to half the depth of the cone. What fraction of the volume of the cup is occupied by the water?

(A) $\frac{1}{2}$ (B) $\frac{1}{8}$
(C) $\frac{1}{4}$ (D) $\frac{3}{4}$

3. Find the value of 214^2 using a suitable identity.

(A) 45797 (B) 45796
(C) 45798 (D) 45795

4. After Over 19, a team's run rate was 6. What is the run rate after 20 overs given the team made 12 runs in the last over?

(A) 6.0 (B) 9.0
(C) 6.3 (D) 6.6

5. List all angles of quadrilateral ABCD adjacent to $\angle A$. List all angles opposite to $\angle A$.

(A) Adjacent: $\angle B, \angle D$; opposite: $\angle C$ (B) Adjacent: $\angle B, \angle C$; opposite: $\angle D$
(C) Adjacent: $\angle C, \angle D$; opposite: $\angle B$ (D) Adjacent: $\angle A, \angle C$; opposite: $\angle B$

6. How many three-digit numbers are divisible by 7?

- (A) 127 (B) 128
(C) 129 (D) 130

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

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

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

- (A) -1 (B) 1
(C) 0 (D) Any non-zero number

9. If $x - y = 17$ and $xy = 15$, find $x^2 + y^2$.

- (A) 319 (B) 321
(C) 317 (D) 289

10. Find the degree of the following polynomial: $4z - 3$.

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

11. Is 1, 2, 4, 8, 16, ... a geometric progression? If so, what is the common ratio?

- (A) No (B) Yes; 1
(C) Yes; 2 (D) Yes; 4

12. Factor completely: $64p^2 + 32pq + 4q^2$.

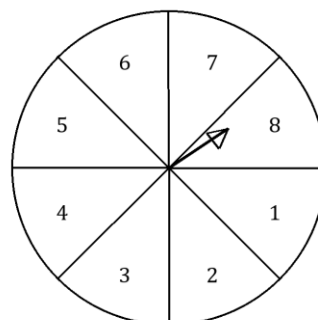
- (A) $4(4p - q)^2$ (B) $4(4p + q)^2$
(C) $(8p + 4q)^2$ (D) $4(2p + q)^2$

13. Find the value of $(127)^3$ using a suitable identity.

- (A) 2048385 (B) 2048383
(C) 2048382 (D) 2048384

14. 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 8?

- (A) $\frac{1}{8}$
(B) $\frac{1}{2}$
(C) $\frac{1}{4}$
(D) 1



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

(A) $\frac{1}{6}$
(C) $\frac{1}{2}$

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

16. 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; $x = 1, y = -1$ is a counterexample

(D) No; $x = y = 1$ is a counterexample

17. How many lines exist that have a given slope?

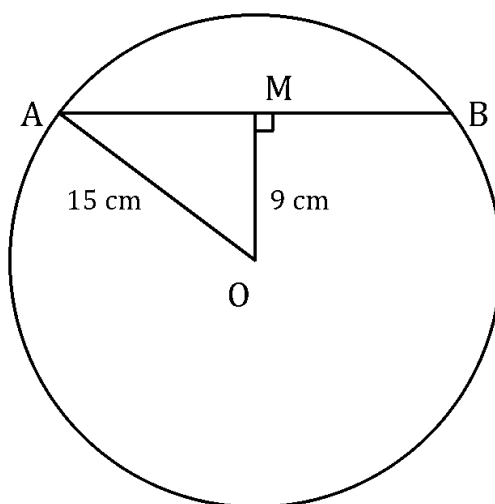
(A) Infinitely many

(B) Exactly two

(C) Exactly one

(D) None

18. 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) 12 cm

(B) 18 cm

(C) 24 cm

(D) 30 cm

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 $(16, 50)$ 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 256 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)

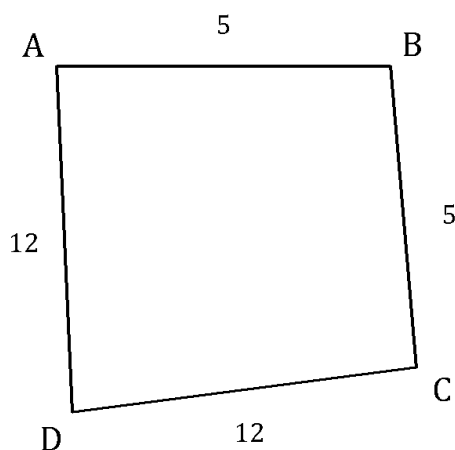
21. Determine the AP whose third term is 16 and whose 7th term exceeds the 5th term by 12.

22. (A) Find 5 rational numbers between $\frac{1}{6}$ and $\frac{2}{5}$.

OR

(B) State whether M is the midpoint of segment ST. Justify your answer.
S (0, 0), M (0, 5), T (0, -10).

23. A cyclic quadrilateral has sides 5, 5, 12, 12 units. Find its area.



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

25. Convert $\frac{3}{50}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

SECTION C

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

26. A positive number is 5 times another number. If 21 is added to both the numbers, then one of the new numbers becomes twice the other new number. What are the numbers?

27. Find the value of $x^3 + y^3 - 12xy + 64$, when $x + y = -4$.

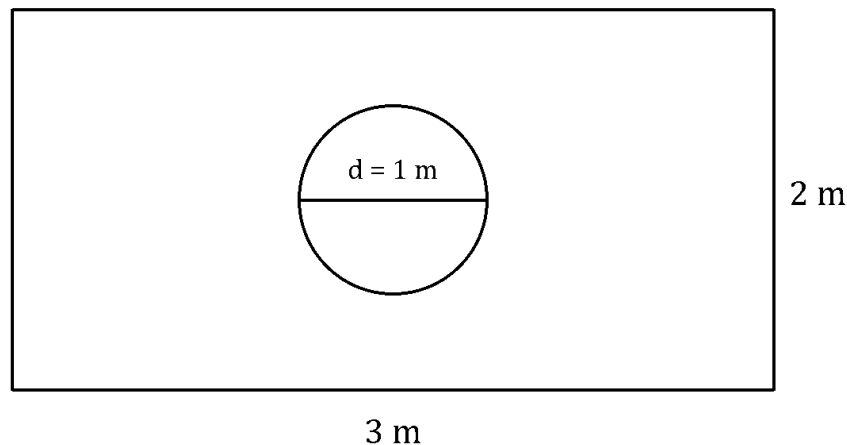
28. Assume that $m \geq n > 0$. Verify that d divides m and n if and only if d divides both n and $m \bmod n$.

29. (A) 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?

OR

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

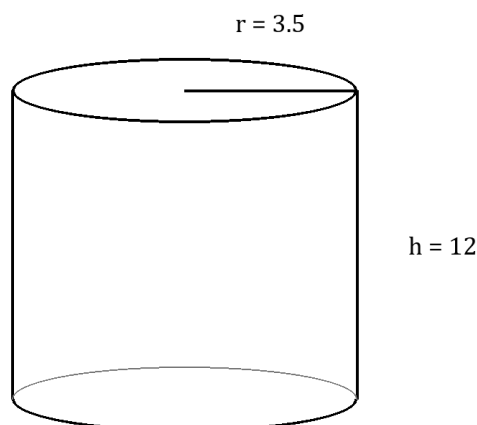
30. (A) Suppose you drop a dye at random on the rectangular region shown in figure. What is the probability that it will land inside the circle with a diameter of 1 m?



OR

(B) 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 school provides milk to its students in cylindrical glasses, each with a diameter of 7 cm. If each glass is filled with milk to a height of 12 cm, how many litres of milk are needed to serve 1600 students? Use $1000 \text{ cm}^3 = 1 \text{ litre}$.



SECTION D

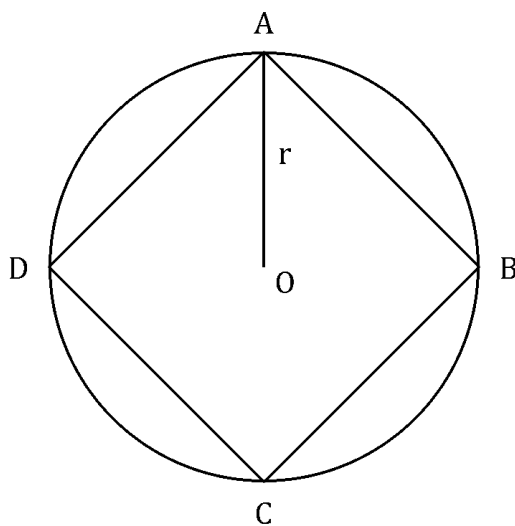
(4 questions $\times$ 5 marks = 20 marks)

32. (A) Let $p(x) = ax + b$ and $q(x) = cx + d$ be two linear polynomials such that (i) the graph of $p(x)$ passes through the points $(2, 3)$ and $(6, 11)$, (ii) the graph of $q(x)$ passes through the point $(4, -1)$, (iii) the graph of $q(x)$ is parallel to the graph of $p(x)$. Find $p(x)$ and $q(x)$. Also find the coordinates of the points where these lines meet the x-axis.

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.

33. 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 $\frac{2}{\pi}$.

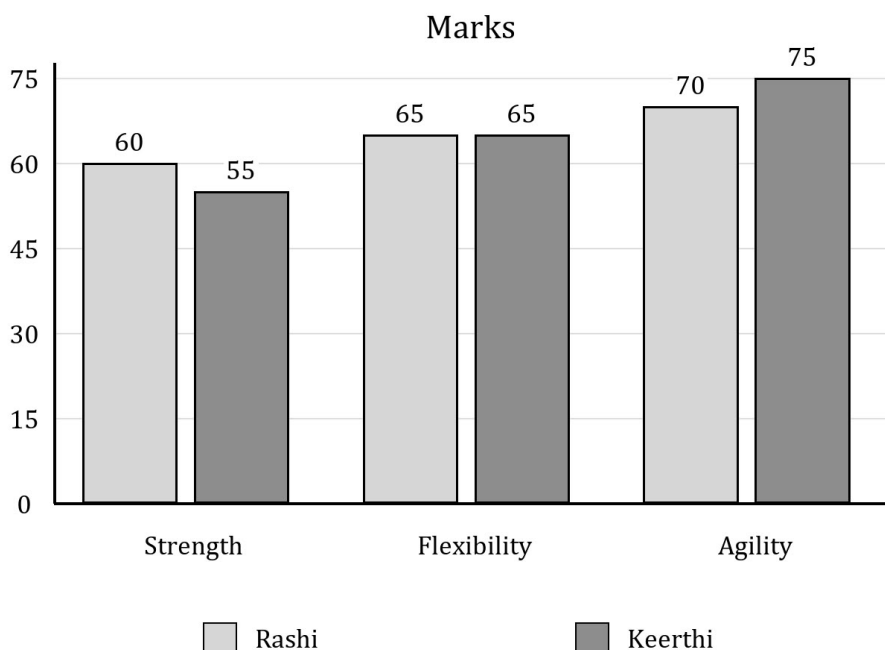


34. (A) A fraction becomes equal to $\frac{9}{11}$ if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and the denominator, it becomes equal to $\frac{5}{6}$. Find the fraction.

OR

(B) In a parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$. Show that APCQ is a parallelogram.

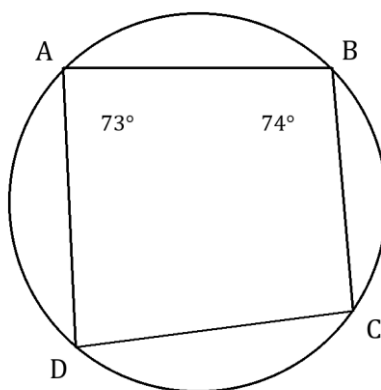
35. A physical fitness evaluation is being undertaken. The final marks are calculated by combining the marks for strength, flexibility, and agility in the ratio 4 : 5 : 6. Rashi has scored 60, 65, and 70. Keerthi has scored 55, 65, and 75 respectively. (i) Find out whose total is more without calculating.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



SECTION E

(3 questions × 4 marks = 12 marks)

36. A designer draws a cyclic quadrilateral ABCD for a circular mosaic. In figure, $\angle A = 73^\circ$ and $\angle B = 74^\circ$. The four vertices lie on the circle.

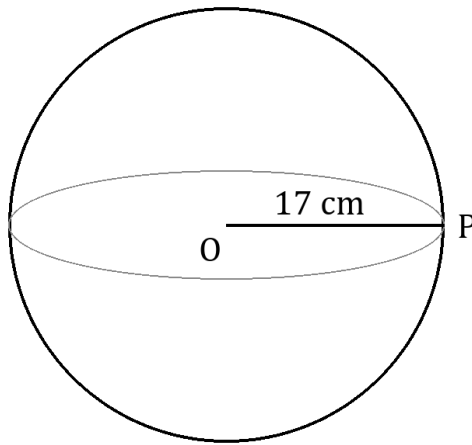


- (i) Find $\angle C$.
- (ii) Find $\angle D$.
- (iii) (A) Verify numerically that both pairs of opposite angles are supplementary.

OR

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

37. A spherical model of radius 17 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. For a probability activity, Tiwari Academy puts 16 red counters and 19 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.