

Mathematics — Ganita Manjari

Sample Question Paper 16

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.

SECTION A

(20 questions $\times$ 1 mark = 20 marks)

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

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

2. 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) Yes; 3 divides 6
(C) No; 3 is a counterexample
(D) Yes; every multiple of 3 is a multiple of 6

3. Find the value of 78^2 using a suitable identity.

(A) 6085 (B) 6084
(C) 6086 (D) 6083

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

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

5. Find the value using a suitable identity: 24×16 .

(A) 386 (B) 383
(C) 384 (D) 385

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

(A) Yes; 1

(B) Yes; 4

(C) Yes; -1

(D) No

7. 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) 1 : 64

(B) 1 : 16

(C) 1 : 4

(D) 4 : 1

8. Find the value of 85^2 using a suitable identity.

(A) 7225

(B) 7227

(C) 7224

(D) 7226

9. Find the degree of the following polynomial: $2x^2 - 5x + 3$.

(A) 0

(B) 3

(C) 2

(D) 1

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

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

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

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

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

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) 2

(B) 1

(C) 4

(D) 3

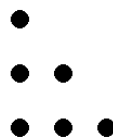
12. Find the 10th triangular number.



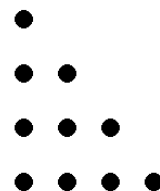
Stage 1



Stage 2



Stage 3



Stage 4

(A) 54

(B) 57

(C) 56

(D) 55

13. If $x - y = 19$ and $xy = 17$, find $x^2 + y^2$.

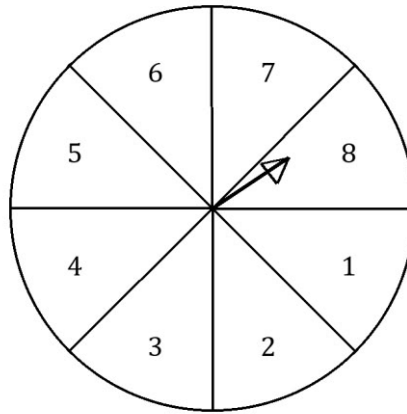
(A) 361

(B) 395

(C) 397

(D) 393

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 a number less than 9?



- (A) 1
(B) $\frac{1}{8}$
(C) 0
(D) $\frac{7}{8}$

15. The distance of a chord of length 16 cm from the centre of a circle is 6 cm. Find the radius of the circle.

- (A) 20 cm
(B) 8 cm
(C) 10 cm
(D) 12 cm

16. Compute $\text{gcd}(60, 16)$ using the improved version of Euclid's algorithm.

- (A) 6
(B) 3
(C) 5
(D) 4

17. Factor completely: $16y^2 - 24y + 9$.

- (A) $(8y - 3)^2$
(B) $(4y - 9)^2$
(C) $(4y + 3)^2$
(D) $(4y - 3)^2$

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

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

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 (18, 56) 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 324 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.

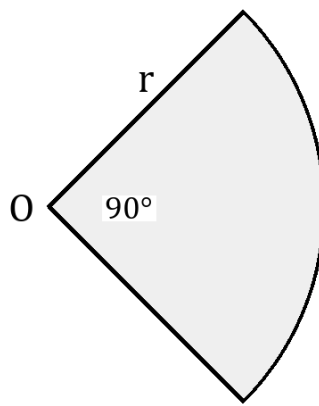
SECTION B

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

21. State whether M is the midpoint of segment ST. Justify your answer.
S (-8, 7), M (0, -2), T (6, -3).

22. 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?

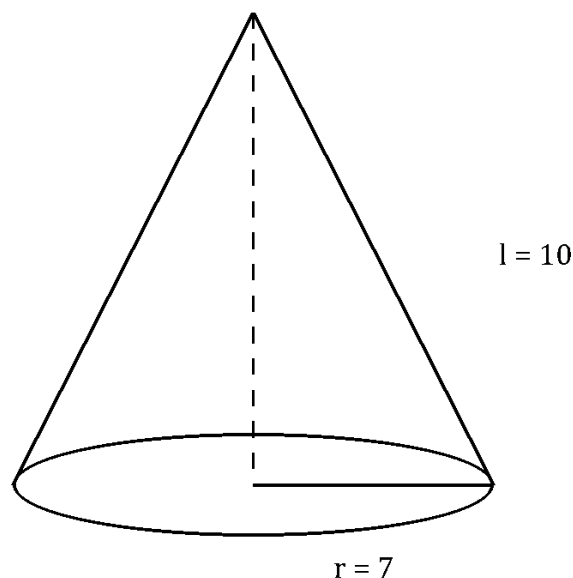
23. (A) Find the area of a quadrant of a circle whose circumference is 66 cm.



OR

(B) Two cubes each of volume 125 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

24. (A) Find the curved surface area of a right circular cone whose slant height is 10 cm and base radius is 7 cm.



OR

(B) 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.

25. The difference between two positive integers is 63. The ratio of the two integers is 2 : 5. Find the two integers.

SECTION C

(6 questions × 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

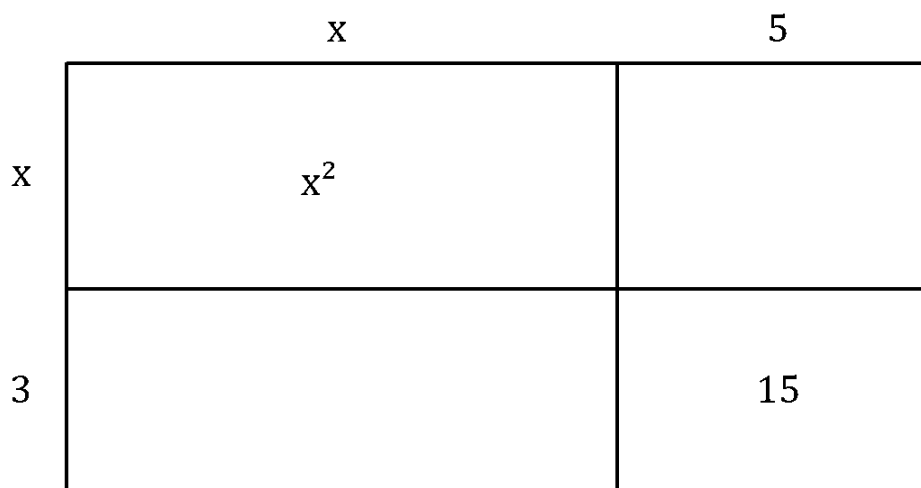
(B) The sides of a triangle are in the ratio 2 : 3 : 4, and its perimeter is 45 cm. Find its area.

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. Write an algorithm $\text{prime}(n)$ to check if n is prime.

29. A tyre company records distances before replacement in 1000 cases: less than 4000 km: 20; 4001–9000 km: 210; 9001–14000 km: 325; more than 14000 km: 445. Find the probability that a randomly chosen tyre lasts (i) less than 4000 km, (ii) between 4000 and 14000 km, (iii) more than 14000 km.

30. 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 .



31. (A) Shreyas holds 25 shares of a company at an average price of ₹150 and Vaishnavi holds 5 shares of the same company at an average price of ₹150.

(i) Shreyas buys 10 shares at ₹30 each. What is his new average price per share?

(ii) Vaishnavi buys some shares at ₹30 each and her new average is ₹70. How many shares did she buy?

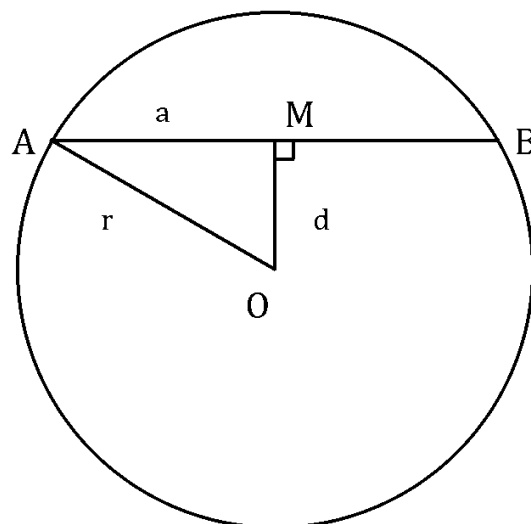
OR

(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.

SECTION D

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

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



OR

(B) Show that the area of a kite is half the product of its diagonals. Show this

(i) using algebra, and

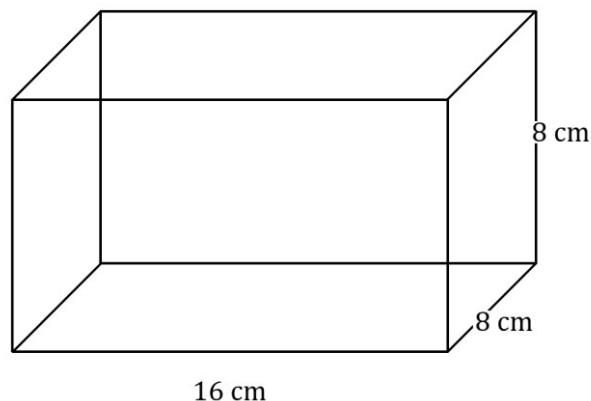
(ii) using geometry.

33. A ball is dropped from a height of 80 metres. After hitting the ground, it bounces back to 60% of the height from which it fell. It continues bouncing in this way.

(i) What height does it reach after the 5th bounce?

(ii) What is the total vertical distance travelled by the time it hits the ground for the 6th time?

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) The price of 9 citrons and 7 fragrant wood-apples taken together is 107; and the price of 7 citrons and 9 fragrant wood-apples taken together is 101. Find the price of each citron and of each fragrant wood-apple.

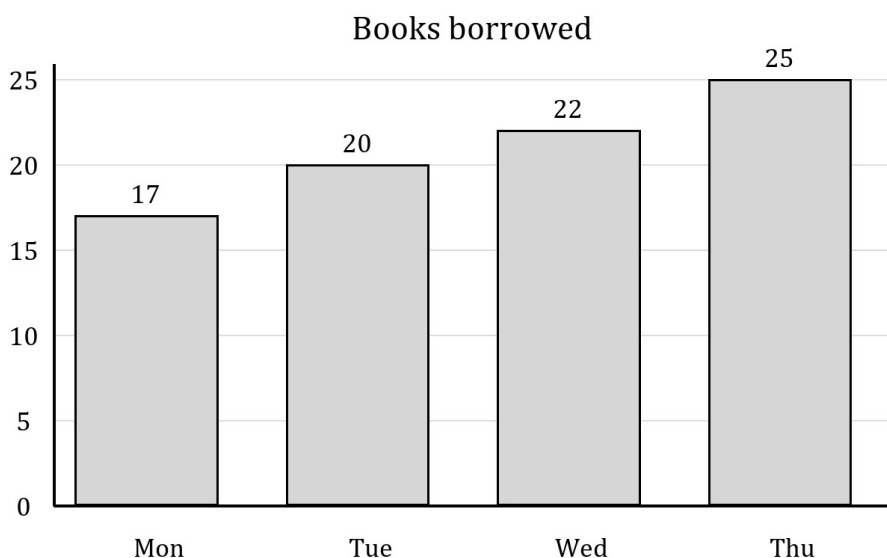
OR

(B) 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.

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

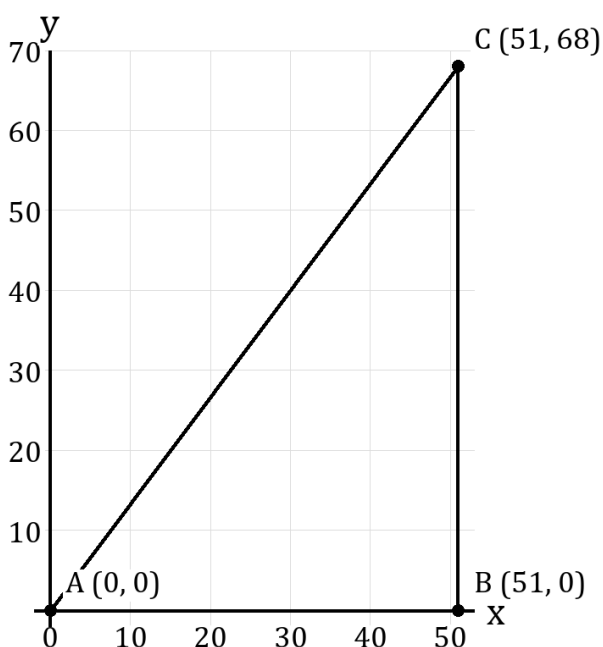
37. Tiwari Academy has 102 pencils and 136 erasers for identical prize packets. Every packet must contain the same number of pencils and the same number of erasers, with no items left over.

- (i) State the divisibility condition on the number of packets.
(ii) Which mathematical quantity gives the greatest possible number of packets?
(iii) (A) Use Euclid's algorithm to find that greatest number.

OR

- (iii) (B) If 34 packets are made, find the contents of each packet and verify the totals.

38. A school survey marks three points on a square coordinate grid: A (0, 0), B (51, 0) and C (51, 68). 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.