

Mathematics — Ganita Manjari

Sample Question Paper 19

Class IX | 2026-27

Time Allowed: 3 Hours

Maximum Marks: 80

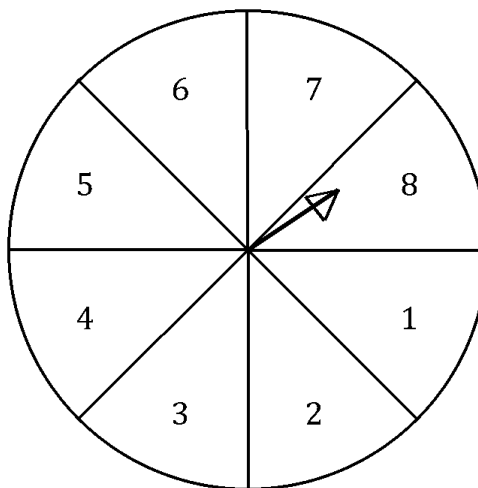
General Instructions

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 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) $\frac{7}{8}$ (B) $\frac{1}{8}$
(C) 0 (D) 1
2. Find the value of 64^2 using a suitable identity.
(A) 4098 (B) 4096
(C) 4097 (D) 4095

3. The probability of an impossible event is _____.

- (A) 0 (B) $\frac{1}{2}$
(C) -1 (D) 1

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

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

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

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

6. Find the value of $(199)^3$ using a suitable identity.

- (A) 7880600 (B) 7880601
(C) 7880598 (D) 7880599

7. If $x - y = 22$ and $xy = 20$, find $x^2 + y^2$.

- (A) 522 (B) 484
(C) 524 (D) 526

8. Find the value of 35^2 using a suitable identity.

- (A) 1225 (B) 1224
(C) 1227 (D) 1226

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

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

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

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

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

12. The number $0.99999\dots$ is exactly equal to _____.

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

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

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

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

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

15. Find the value of 105^2 using a suitable identity.

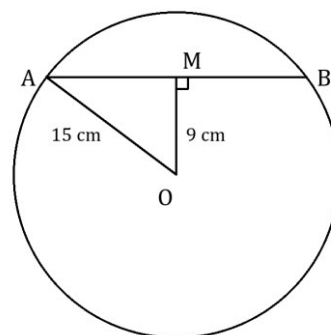
- (A) 11024 (B) 11025
(C) 11026 (D) 11027

16. Find the degree of the following polynomial: -9 .

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

17. 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) 30 cm
(D) 24 cm



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

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

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 (21, 45) 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 441 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 × 2 marks = 10 marks)

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

OR

(B) Find (i) the curved surface area and (ii) the total surface area of a hemisphere of radius 21 cm.

22. (A) Convert $\frac{4}{15}$ into a terminating decimal or a non-terminating repeating decimal by the process of long division.

OR

(B) Execute the algorithm to compute the divisors of 135.

23. 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.



24. Sarita is reading a book of 500 pages. She reads 20 pages every day. How many pages will be left after 15 days? Express this as a linear pattern.

25. ABCD is a cyclic quadrilateral inscribed in a circle. If $\angle A$ measures 75° , what is the measure of $\angle C$? If $\angle B$ measures 110° , what is the measure of $\angle D$?

SECTION C

(6 questions × 3 marks = 18 marks)

26. Which term of the GP: 2, 6, 18, ... is 4374? Write the explicit formula as well as the recursive formula for the n th term.

27. An AP consists of 50 terms in which the 3rd term is 12 and the last term is 106. Find the 29th term.

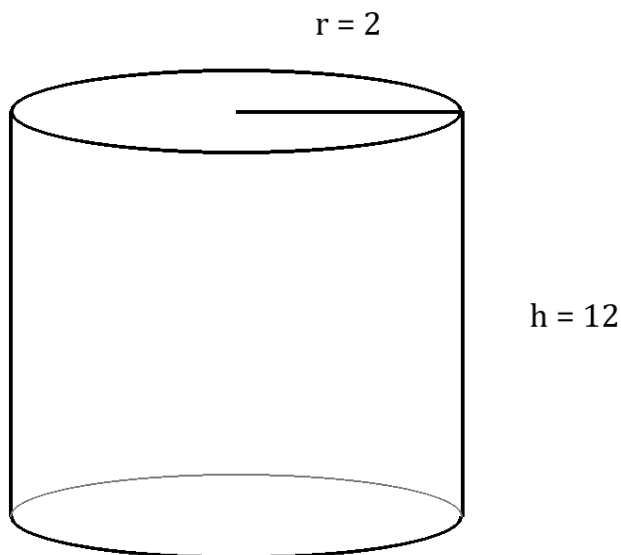
28. (A) A positive number is 5 times another number. If 21 is added to both the numbers, then one of the new numbers becomes twice the other new number. What are the numbers?

OR

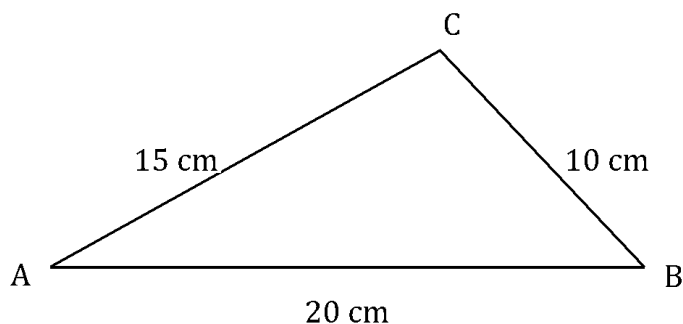
(B) Given the points A (1, -8), B (-4, 7) and C (-7, -4), show that they lie on a circle K whose centre is the origin O (0, 0). What is the radius of circle K? Given the points D (-5, 6) and E (0, 9), check whether D and E lie within the circle, on the circle, or outside the circle K.

29. You have a box containing 3 red pens, 4 black pens and 2 green pens. You pick a pen (without looking) from the box and put it back. Then your friend does the same. (i) What are the possible outcomes of the pen colours? Draw a tree diagram representing the possible outcomes. (ii) Find the probability that both you and your friend pick pens of the same colour.

30. A solid metallic cube of side 12 cm is melted and recast into solid cylindrical rods, each having radius 2 cm and height 12 cm. Find (i) the volume of the cube, (ii) the volume of one cylindrical rod, (iii) the approximate number of complete cylindrical rods that can be formed. (Use $\pi = \frac{22}{7}$.)



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



OR

(B) 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.

SECTION D

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

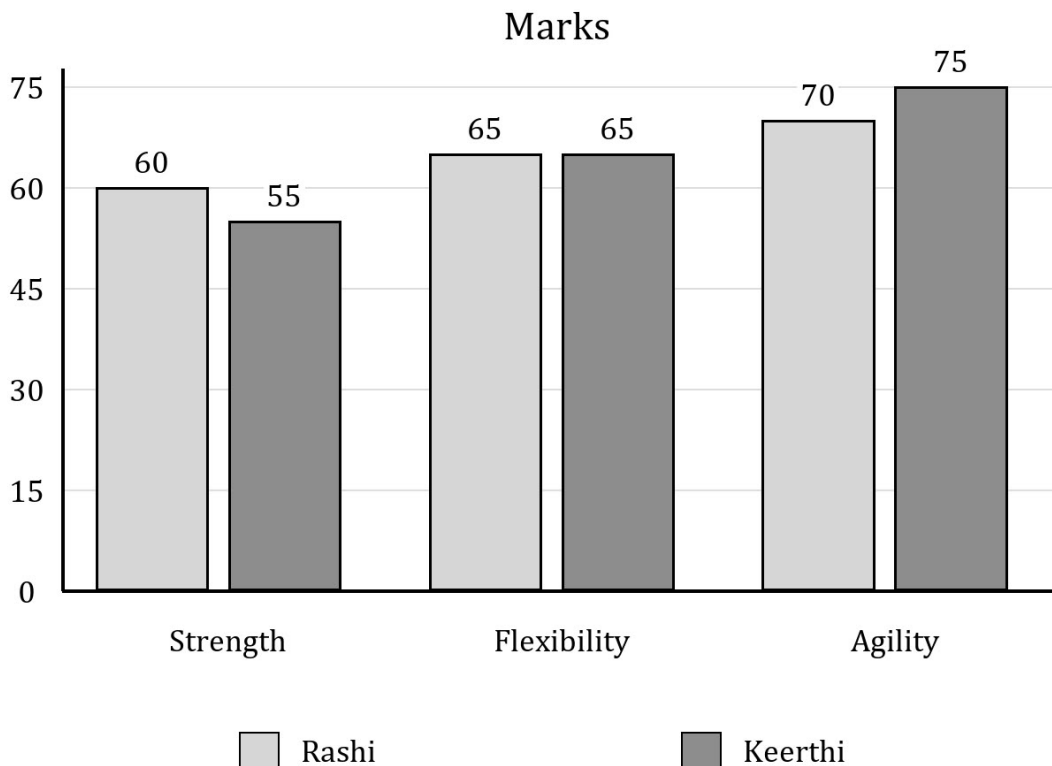
32. (A) 5 pencils and 7 pens together cost ₹50, whereas 7 pencils and 5 pens together cost ₹46. Find the cost of each pencil and pen.

OR

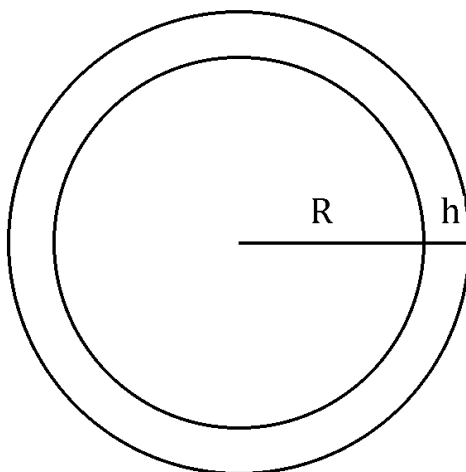
(B) The coach of a cricket team buys 7 bats and 6 balls for ₹8880. Later, she buys 3 bats and 5 balls for ₹4000. Find the cost of each bat and each ball.

33. 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.

34. 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?



35. (A) 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?



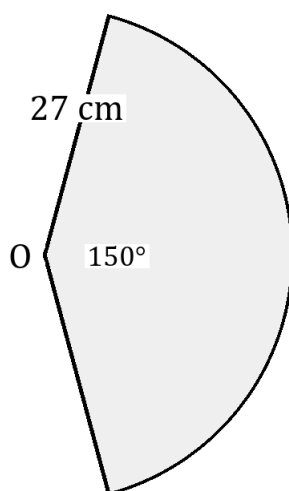
OR

(B) 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?

SECTION E

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

36. A circular display has radius 27 cm. A coloured sector subtends 150° 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. For a probability activity, Tiwari Academy puts 21 red counters and 24 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?

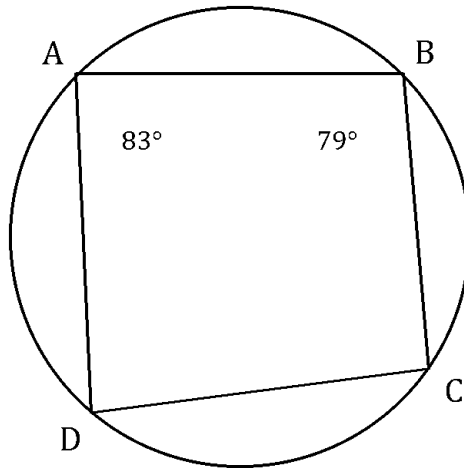
(ii) Find the probability of red on the first draw.

(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.

38. A designer draws a cyclic quadrilateral ABCD for a circular mosaic. In figure, $\angle A = 83^\circ$ and $\angle B = 79^\circ$. 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 $\angle D$.