

Mathematics Standard

Sample Question Paper 9

Class X | Code 041 | 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

Questions 1 to 20 carry 1 mark each. ($20 \times 1 = 20$)

1. The mean ages of men and women in a group are 48 and 32 years. The combined mean is 38 years. The percentage of women is:

- | | |
|---------|-----------|
| (A) 25% | (B) 62.5% |
| (C) 50% | (D) 75% |

2. The HCF of 44 and 77 is 11. Their LCM is:

- | | |
|---------|---------|
| (A) 308 | (B) 319 |
| (C) 121 | (D) 11 |

3. The distance between A(0, 7) and B(5, 11) is:

- | | |
|-----------------------|-------------|
| (A) $\sqrt{45}$ units | (B) 9 units |
| (C) $\sqrt{41}$ units | (D) 1 units |

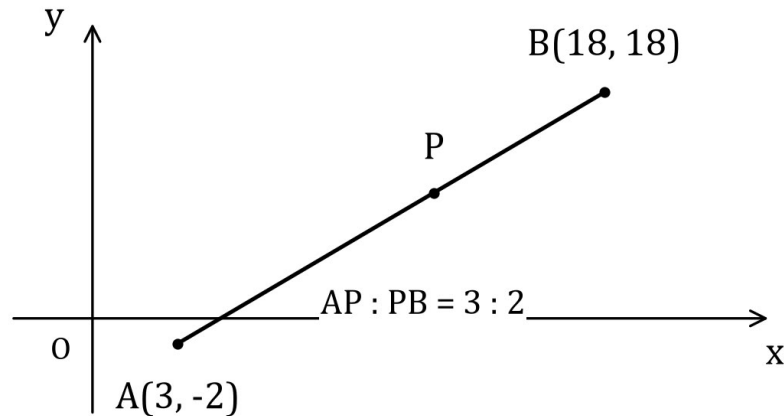
4. The 20th term of the AP 11, 16, 21, ... is:

- | | |
|---------|---------|
| (A) 106 | (B) 111 |
| (C) 101 | (D) 116 |

5. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a club or a jack?

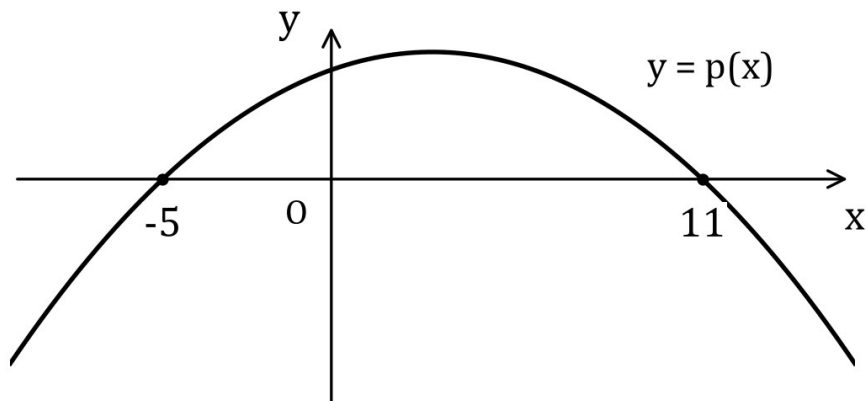
- | | |
|---------------------|---------------------|
| (A) $\frac{4}{13}$ | (B) $\frac{17}{52}$ |
| (C) $\frac{15}{52}$ | (D) $\frac{9}{13}$ |

6. Using the coordinate diagram, p divides A(3, -2) and B(18, 18) internally in the ratio 3 : 2. P is:



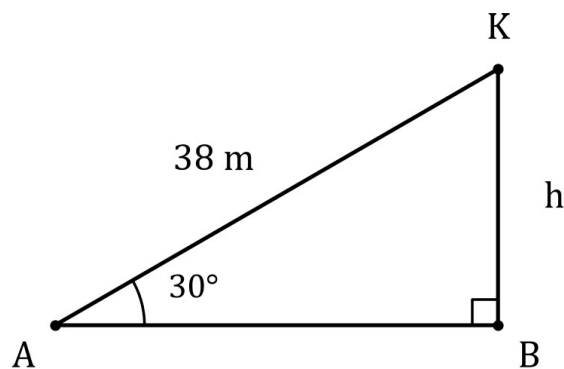
- (A) (13, 10) (B) (12, 11)
(C) (11, 9) (D) (12, 10)

7. The graph of a quadratic polynomial $p(x)$ is shown. The sum of its zeroes is:



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

8. A kite is attached to a taut string of length 38 m, held at ground level. Using the angle shown, its height above the ground is:



- (A) 38 m (B) 20 m
(C) 19 m (D) 18 m

9. The table gives the time spent on revision by a group of students. The modal class is:

Minutes	0-10	10-20	20-30	30-40	40-50
Students	5	5	20	7	4

- (A) 0-10 minutes
- (B) 20-30 minutes
- (C) 10-20 minutes
- (D) 30-40 minutes

10. The roots of $x^2 - 10x = 0$ are:

- (A) 0, -10
- (B) 0, 10
- (C) 10, -10
- (D) 1, 10

11. In $\triangle ABC$, D lies on AB and E on AC; $DE \parallel BC$, $AD : DB = 2 : 5$ and $BC = 77$ cm. DE equals:

- (A) 23 cm
- (B) 24 cm
- (C) 77 cm
- (D) 22 cm

12. The lines $10x + 2y = 5$ and $40x + ky = 7$ are parallel when k is:

- (A) 4
- (B) -8
- (C) 8
- (D) 9

13. An arc has length 10π cm and its sector has area 65π cm². The radius is:

- (A) 26 cm
- (B) $\frac{13}{2}$ cm
- (C) 13 cm
- (D) 15 cm

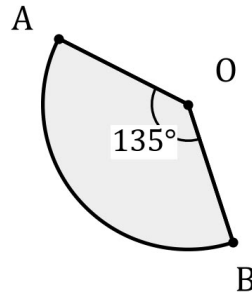
14. A cone of radius 9 cm and height 9 cm is joined to a hemisphere of the same radius. The volume of the solid is:

- (A) 1458π cm³
- (B) 243π cm³
- (C) 729π cm³
- (D) 2187π cm³

15. A bag contains 11 red, 9 blue and 4 green balls. One ball is drawn at random. The probability that it is not blue is:

- (A) 0
- (B) 1
- (C) $\frac{11}{24}$
- (D) $\frac{5}{8}$

16. In the sector diagram, a circle has radius 77 cm. Find the length of the arc subtending 135° at its centre.



- (A) $\frac{363}{4}$ cm (B) 363 cm
(C) $\frac{377}{2}$ cm (D) $\frac{363}{2}$ cm

17. A card is drawn at random from cards numbered 1 to 46. The probability of a perfect-square number is:

- (A) $\frac{3}{23}$ (B) $\frac{7}{46}$
(C) $\frac{5}{46}$ (D) $\frac{20}{23}$

18. For an acute angle θ , $\sin \theta = \frac{99}{101}$. Find $\cot \theta$.

- (A) $\frac{99}{20}$
(B) $\frac{20}{99}$
(C) $\frac{20}{101}$
(D) $\frac{101}{99}$

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 zeroes of $x^2 - 22x + 120$ are 10 and 12.

Reason (R): A real number a is a zero of $p(x)$ precisely when $p(a) = 0$.

20. Assertion (A): If $A(9, -5)$ and $B(t, 0)$ lie on the circle with centre $O(4, -5)$, then $t = 4$.

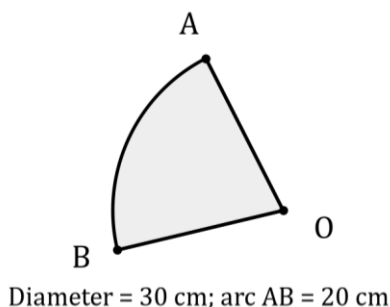
Reason (R): The centre of a circle is the midpoint of every chord.

SECTION B

Questions 21 to 25 carry 2 marks each. ($5 \times 2 = 10$)

21. For an acute angle θ , $\tan \theta = \frac{10}{13}$. Find $\sin \theta$ and $\cos \theta$.

22. The shaded sector has the dimensions shown. Find its area.



23. Two fair dice, one red and one blue, are thrown together. Find the probability that (i) the sum is less than 5, and (ii) this event does not occur.

24. (A) In $\triangle ABC$, D is on AB and E on AC, with $DE \parallel BC$. Given $AD = 12$ cm, $DB = 16$ cm and $AE = 36$ cm, find the full length AC.

OR

(B) In $\triangle PQR$, S lies on PQ and T on PR. Given $PS = 22$ cm, $SQ = 33$ cm, $PT = 44$ cm and $TR = 67$ cm, decide whether $ST \parallel QR$. Justify your answer.

25. (A) Two tanks contain 385 litres and 605 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

OR

(B) The HCF of 240 and 420 is written as $11m - 11$. Find m.

SECTION C

Questions 26 to 31 carry 3 marks each. ($6 \times 3 = 18$)

26. Find the zeroes of $3x^2 - 3x - 270$ and verify the relationships between its zeroes and coefficients.

27. Given that $\sqrt{7}$ is irrational, prove that $9 + 2\sqrt{7}$ is irrational.

28. (A) The sum of the first 20 terms of an AP is 580, and its fourth term is 16. Find its twentieth term.

OR

(B) Find the sum of all integers strictly between 18 and 230 that are divisible by 5.

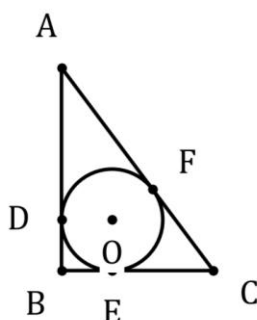
29. Find the coordinates of the points of trisection of the segment joining A(2, -4) and B(8, 11).

30. (A) For an acute angle θ , $\tan \theta + \cot \theta = 11$. Find $\tan^2 \theta + \cot^2 \theta$ and $\tan^3 \theta + \cot^3 \theta$.

OR

(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{10}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

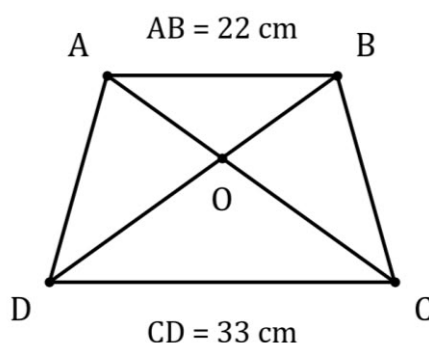
31. The circle in the figure is inscribed in right triangle ABC and touches AB, BC and CA at D, E and F respectively. AB = 44 cm, BC = 33 cm and AC = 55 cm. Find AD, BE and CF.



SECTION D

Questions 32 to 35 carry 5 marks each. ($4 \times 5 = 20$)

32. Using the figure, in trapezium ABCD, $AB \parallel CD$, $AB = 22$ cm and $CD = 33$ cm. Diagonals AC and BD intersect at O, with $AC = 110$ cm and $BD = 110$ cm. Prove that $\triangle AOB \sim \triangle COD$, and find AO, OC, BO and OD.

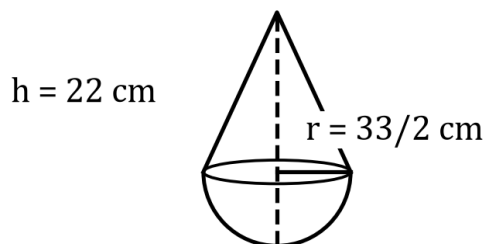


33. (A) An observer on the deck of a ship, 24 m above water, sees the top of a hill at an elevation of 60° and its foot at a depression of 30° . Find the horizontal distance to the hill and its height above water.

OR

(B) From a window 44 m above level ground, the angles of elevation of the top and depression of the foot of a building across a street are 60° and 45° . Find the street width and the height of that building. Give exact values.

34. (A) A wooden toy is formed by a cone fixed on a hemisphere of the same radius $\frac{33}{2}$ cm. Its total height is $\frac{77}{2}$ cm. Find the exposed surface area and the cost of painting it at ₹12 per cm^2 . Give exact values.



OR

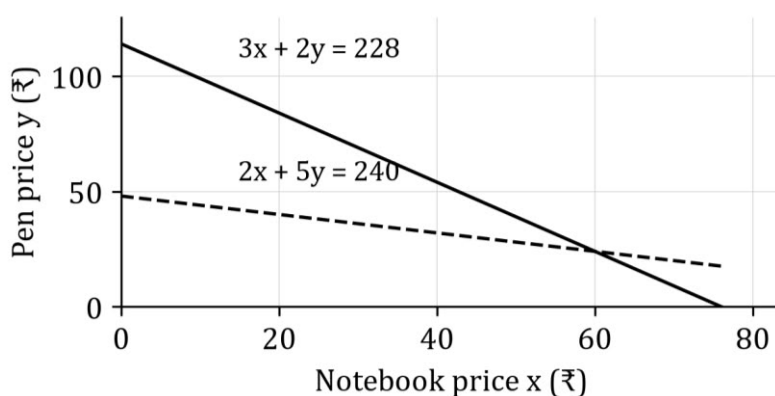
(B) A closed thin-sheet model consists of a cylinder with a cone attached at each end. The common radius is 5 cm, the total length is $\frac{103}{3}$ cm, and each cone is $\frac{20}{3}$ cm high. Find the volume of air inside and the total outer surface area. Neglect sheet thickness and give exact values.

35. A rectangular lawn measures 56 m by 46 m. A rectangular pond is built in its centre, leaving a uniform-width grass strip along all four edges. The grass strip has area 920 m^2 . Find its width and the pond dimensions.

SECTION E

Questions 36 to 38 carry 4 marks each. ($3 \times 4 = 12$)

36. A school buys notebooks and pens for its mathematics club. Three notebooks and two pens cost ₹228, while two notebooks and five pens cost ₹240. Let the price of a notebook be ₹x and that of a pen be ₹y. The accompanying graph represents these data.



- (i) Write the equation for the first purchase.
- (ii) Write the equation for the second purchase.
- (iii) (A) Find the price of each item.

OR

- (iii) (B) Find the cost of four notebooks and three pens.

37. A circular garden has two concentric boundaries with centre O and radii 45 m and 27 m. A straight path AB is a chord of the outer circle and touches the inner circle at M.

(i) Find $\angle OMA$.

(ii) Find AM.

(iii) (A) Find AB and the area of $\triangle OAB$.

OR

(iii) (B) Another chord of the outer circle is 36 m from O. Find its length.

38. Tiwari Academy records the scores of 56 students in a mathematics quiz. The grouped frequency distribution is given below. The classes are continuous, with the upper endpoint excluded from each class.

Score	0-10	10-20	20-30	30-40	40-50
Students	3	8	13	24	8

(i) State the modal class.

(ii) State the median class.

(iii) (A) Calculate the mean score, correct to two decimal places.

OR

(iii) (B) Calculate the mode, correct to two decimal places.