

Mathematics Standard

Sample Question Paper 8

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 zeroes of $9x^2 + 27x + c$ are reciprocal to each other. The value of c is:

- (A) -9 (B) 18
(C) 9 (D) 10

2. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a diamond or a queen?

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

3. 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	4	8	19	10	5

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

4. The value of $11\sec^2\theta - 11\tan^2\theta$, where defined, is:

- (A) 11 (B) 0
(C) 1 (D) 22

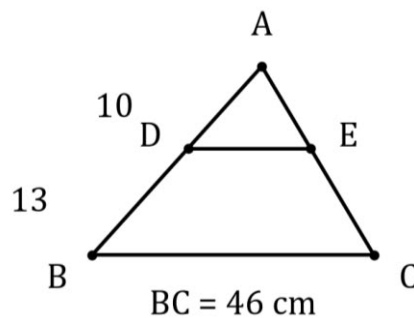
5. For a distribution, mean = 32 and median = 35. The estimated mode using the empirical relation is:

- (A) 41 (B) 44
(C) 38 (D) 67

6. If $x - y = -1$ and $x + y = 17$, then (x, y) equals:

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

7. In the figure, $AD = 10$ cm, $DB = 13$ cm and $BC = 46$ cm. $DE \parallel BC$. The length DE is:



- (A) 22 cm (B) 18 cm
(C) 20 cm (D) 21 cm

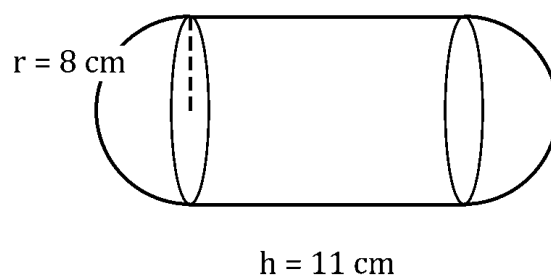
8. The HCF of 26 and 39 is:

- (A) 14 (B) 26
(C) 39 (D) 13

9. Which term of the AP 9, 13, 17, ... is 81?

- (A) 20 (B) 18
(C) 21 (D) 19

10. The solid shown is described as follows. A capsule has a cylindrical middle of radius 8 cm and length 11 cm, with a hemisphere of radius 8 cm at each end. Its total length is:



- (A) 19 cm (B) 27 cm
(C) 11 cm (D) 30 cm

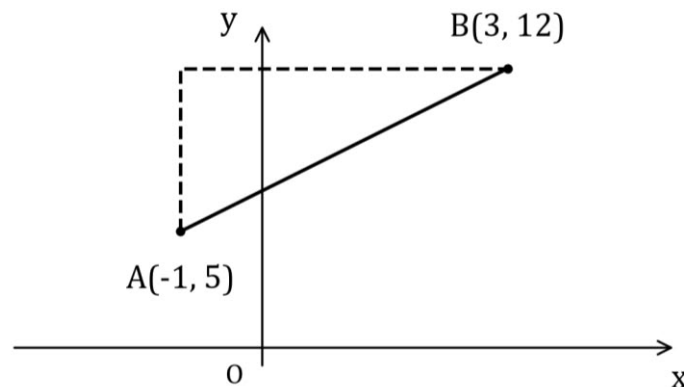
11. A wheel of diameter 56 cm travels $\frac{198}{25}$ km. Its number of complete revolutions is:

- (A) 450 (B) 4500
(C) 45000 (D) 5000

12. A circle has radius 70 cm. Find the length of the arc subtending 120° at its centre.

- (A) $\frac{220}{3}$ cm (B) $\frac{880}{3}$ cm
(C) $\frac{440}{3}$ cm (D) $\frac{461}{3}$ cm

13. Using the coordinate diagram, the distance between A(-1, 5) and B(3, 12) is:

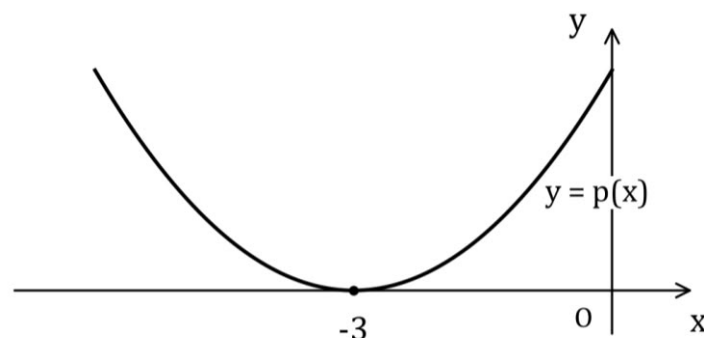


- (A) $\sqrt{69}$ units (B) $\sqrt{65}$ units
(C) 11 units (D) 3 units

14. A card is drawn at random from cards numbered 1 to 44. The probability of a perfect-square number is:

- (A) $\frac{7}{44}$ (B) $\frac{5}{44}$
(C) $\frac{19}{22}$ (D) $\frac{3}{22}$

15. The graph of the quadratic polynomial $p(x)$ touches the x-axis at the point marked below. Its two zeroes, counting multiplicity, are:



- (A) -3, -3 (B) -4, -2
(C) -3, -2 (D) -4, -3

16. A bag contains 10 red, 8 blue and 3 green balls. One ball is drawn at random. The probability that it is not blue is:

- (A) 0 (B) 1
(C) $\frac{13}{21}$ (D) $\frac{10}{21}$

17. A tower of height 17 m casts a shadow of length 17 m on level ground. The angle of elevation of the Sun is:

- (A) 30° (B) 60°
(C) 90° (D) 45°

18. P divides A(2, -1) and B(32, 14) internally in the ratio 2 : 3. P is:

- (A) (15, 5) (B) (14, 6)
(C) (14, 5) (D) (13, 4)

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 sum of the zeroes of $x^2 - 29x - 342$ is 30.

Reason (R): For $ax^2 + bx + c$, the sum of the zeroes is $-b/a$.

20. Assertion (A): The distance between (3, -4) and (15, 12) is 21 units.

Reason (R): The distance between (x_1, y_1) and (x_2, y_2) is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

SECTION B

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

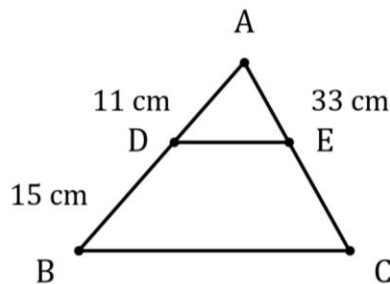
21. A sector belongs to a circle of diameter 28 cm. Its corresponding arc is 18 cm long. Find the area of the sector.

22. Two fair dice, one red and one blue, are thrown together. Find the probability that (i) the first number exceeds the second by 2, and (ii) this event does not occur.

23. For an acute angle θ , $\cot \theta = \frac{3}{4}$.

Evaluate $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$.

24. (A) In the figure, D lies on AB and E on AC, with $DE \parallel BC$. $AD = 11$ cm, $DB = 15$ cm and $AE = 33$ cm. Find the full length AC.



OR

(B) In ΔPQR , S lies on PQ and T on PR. Given $PS = 20$ cm, $SQ = 30$ cm, $PT = 40$ cm and $TR = 61$ cm, decide whether $ST \parallel QR$. Justify your answer.

25. (A) Two tanks contain 350 litres and 550 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

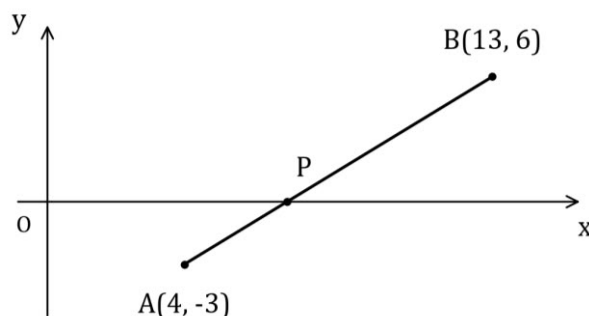
OR

(B) The HCF of 216 and 378 is written as $10m - 10$. Find m .

SECTION C

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

26. Using the coordinate diagram, in what ratio does the x-axis divide the segment joining $A(4, -3)$ and $B(13, 6)$? Also find the point of division.



27. Given that $\sqrt{5}$ is irrational, prove that $8 - 5\sqrt{5}$ is irrational.

28. The incircle of a right triangle ABC touches AB, AC and BC at F, E and D respectively. $AB = 27$ cm, $AC = 36$ cm and $BC = 45$ cm. Find AF, BD and CD.

29. (A) For an acute angle θ , $12\sin^2\theta + 9\cos^2\theta = \frac{39}{4}$. Find $\sin^2\theta$, $\tan \theta$ and $\sec \theta$.

OR

(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{9}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

30. (A) The sum of the fifth and ninth terms of an AP is 78; the sum of its seventh and twelfth terms is 103. Find the AP.

OR

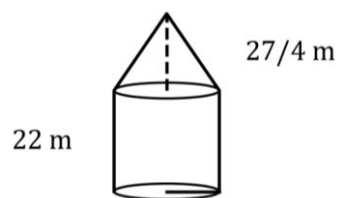
(B) Find the sum of all integers strictly between 17 and 220 that are divisible by 4.

31. Find the monic quadratic polynomial whose zeroes have sum 10 and product - 11. If its zeroes are α and β , also find $\alpha^2 + \beta^2$.

SECTION D

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

32. (A) A tent has a cylindrical lower part of radius 9 m and height 22 m, with a conical roof of height $\frac{27}{4}$ m. Its base is open. Find the canvas needed, allowing an additional 17 m^2 for stitching, and its cost at ₹11 per m^2 . Give exact values.

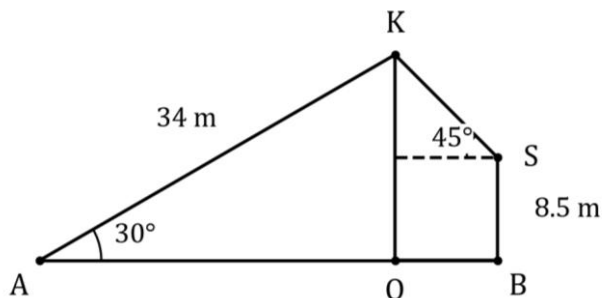


OR

(B) A closed thin-sheet model consists of a cylinder with a cone attached at each end. The common radius is $\frac{9}{2}$ cm, the total length is 31 cm, and each cone is 6 cm high. Find the volume of air inside and the total outer surface area. Neglect sheet thickness and give exact values.

33. In $\triangle ABC$, points D and E lie on AB and AC respectively. $AD = 11$ cm, $DB = 13$ cm, $AE = 22$ cm, $EC = 26$ cm and $BC = 48$ cm. Prove that $DE \parallel BC$ and $\triangle ADE \sim \triangle ABC$. Find DE and the perimeter of $\triangle ADE$.

34. (A) A kite K is attached to a taut 34 m string held at ground point A, making 30° with the ground. An observer S on a roof 8.5 m high sees K at an elevation of 45° . A and the building lie on opposite sides of the point O vertically below K. Find the height KO and horizontal distance AB in exact form.



OR

(B) From a window 41 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.

35. After the price of a book is reduced by ₹5, a customer can buy 5 more books for ₹2750. Find the original price and the original number of books the customer could buy.

SECTION E

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

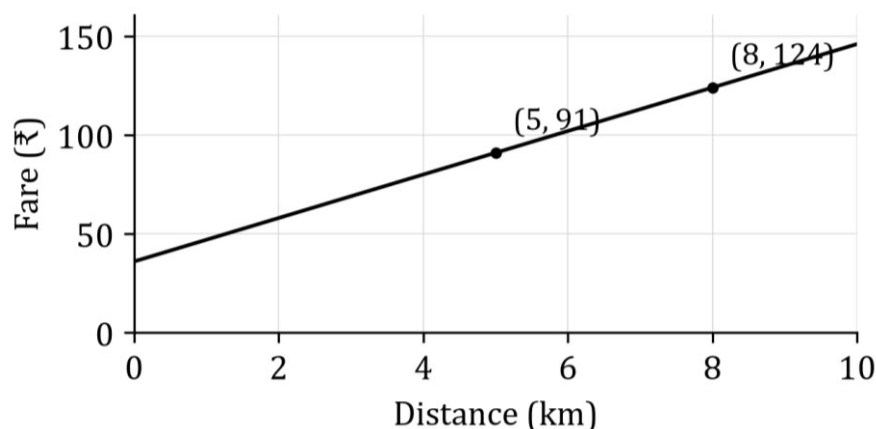
36. A designer draws two tangents PA and PB to a circle with centre O. The radius is 10 cm and $OP = 20$ cm. The segment OP lies inside $\angle APB$.

- (i) Find $\angle OAP$.
- (ii) Find PA in exact form.
- (iii) (A) Find $\angle APB$ and $\angle AOB$.

OR

- (iii) (B) Find the perimeter of $\triangle APB$ in exact form.

37. A taxi operator charges a fixed starting fee and a constant fare per kilometre. A 5 km journey costs ₹91 and an 8 km journey costs ₹124. Let the starting fee be ₹x and the fare per kilometre be ₹y. The accompanying graph represents these data.



- (i) Write the equation for the 5 km journey.
- (ii) Write the equation for the 8 km journey.
- (iii) (A) Find the starting fee and the fare per kilometre.

OR

- (iii) (B) Find the cost of a 12 km journey.

38. Tiwari Academy records the scores of 59 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	6	7	12	23	11

- (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.