

Mathematics Standard

Sample Question Paper 12

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.
9. Draw neat figures wherever required. Use $\pi = 22/7$ unless another value is stated.
10. Use of calculators is not allowed.

SECTION A

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

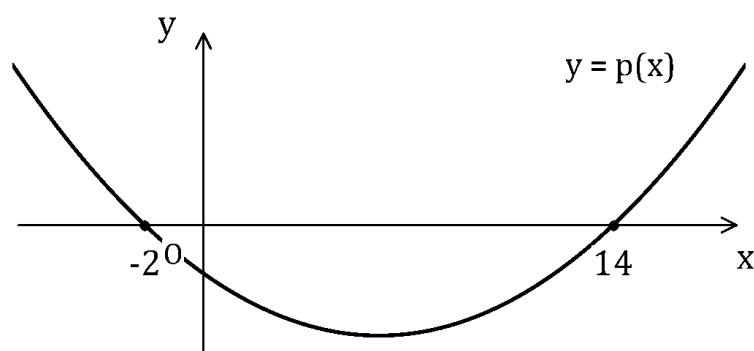
1. The HCF of 56 and 98 is 14. Their LCM is:

- (A) 406 (B) 154
(C) 14 (D) 392

2. A wheel of diameter 84 cm travels $\frac{429}{25}$ km. Its number of complete revolutions is:

- (A) 650 (B) 6500
(C) 65000 (D) 7000

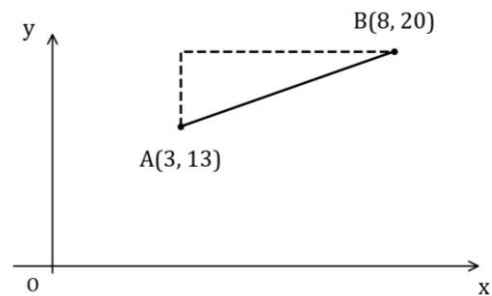
3. The graph of a quadratic polynomial $p(x)$ is shown. The product of its zeroes is:



- (A) -27 (B) -29
(C) -28 (D) -26

4. Using the coordinate diagram, the distance between A(3, 13) and B(8, 20) is:

- (A) $\sqrt{78}$ units
- (B) $\sqrt{74}$ units
- (C) 12 units
- (D) 2 units



5. For $x^2 + px + 169 = 0$ to have equal roots, p must be:

- (A) ± 26
- (B) 13
- (C) -13
- (D) 0

6. The value of $15\sec^2\theta - 15\tan^2\theta$, where defined, is:

- (A) 15
- (B) 0
- (C) 1
- (D) 30

7. P divides A(6, -5) and B(36, 15) internally in the ratio 3 : 2. P is:

- (A) (25, 7)
- (B) (24, 8)
- (C) (24, 7)
- (D) (23, 6)

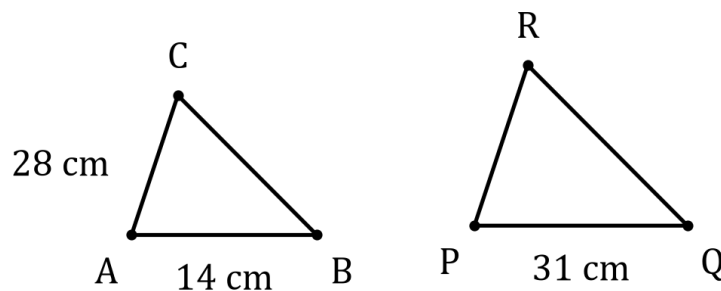
8. For a distribution, mean = 36 and median = 39. The estimated mode using the empirical relation is:

- (A) 45
- (B) 48
- (C) 42
- (D) 75

9. If $x - y = -1$ and $x + y = 25$, then (x, y) equals:

- (A) (13, 12)
- (B) (12, 13)
- (C) (-12, 13)
- (D) (12, -13)

10. The figure shows $\triangle ABC \sim \triangle PQR$, with $A \leftrightarrow P$, $B \leftrightarrow Q$ and $C \leftrightarrow R$. $AB = 14$ cm, $PQ = 31$ cm and $AC = 28$ cm. PR is:



- (A) 64 cm
- (B) 60 cm
- (C) 62 cm
- (D) 63 cm

11. Which term of the AP 17, 20, 23, ... is 83?

- (A) 24 (B) 22
(C) 25 (D) 23

12. A tower of height 21 m casts a shadow of length 21 m on level ground. The angle of elevation of the Sun is:

- (A) 30° (B) 60°
(C) 90° (D) 45°

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

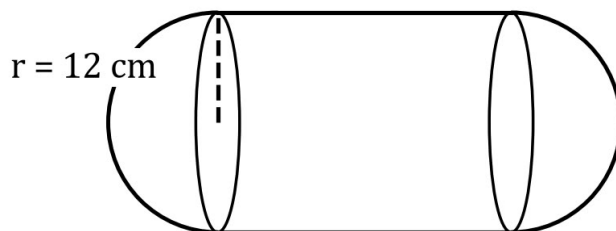
Minutes	0-10	10-20	20-30	30-40	40-50
Students	5	8	23	10	5

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

14. A circle has radius 98 cm. Find the length of the arc subtending 180° at its centre.

- (A) 154 cm (B) 616 cm
(C) 308 cm (D) 315 cm

15. The solid shown is described as follows. A capsule has a cylindrical middle of radius 12 cm and length 15 cm, with a hemisphere of radius 12 cm at each end. Its total length is:



$h = 15 \text{ cm}$

- (A) 27 cm (B) 39 cm
(C) 15 cm (D) 42 cm

16. A bag contains 14 red, 7 blue and 4 green balls. One ball is drawn at random. The probability that it is not blue is:

- (A) 0 (B) 1
(C) $\frac{18}{25}$ (D) $\frac{14}{25}$

17. A card is drawn at random from cards numbered 1 to 52. The probability of a perfect-square number is:

(A) $\frac{2}{13}$

(B) $\frac{3}{26}$

(C) $\frac{45}{52}$

(D) $\frac{7}{52}$

18. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a heart numbered 3, 5, 7 or 9?

(A) $\frac{5}{52}$

(B) $\frac{3}{52}$

(C) $\frac{12}{13}$

(D) $\frac{1}{13}$

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 $x^2 - 29x - 546$ is 30.

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

20. Assertion (A): The distance between (7, -8) and (16, 4) is 16 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. Two fair dice, one red and one blue, are thrown together. Find the probability that (i) the product equals 12, and (ii) this event does not occur.

22. (A) Two tanks contain 490 litres and 770 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

OR

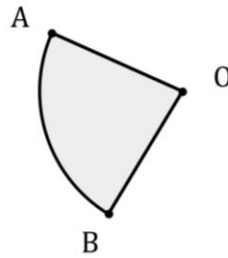
(B) The HCF of 312 and 546 is written as $14m - 14$. Find m .

23. (A) In $\triangle ABC$, D is on AB and E on AC, with $DE \parallel BC$. Given $AD = 15$ cm, $DB = 19$ cm and $AE = 45$ cm, find the full length AC.

OR

(B) In $\triangle PQR$, S lies on PQ and T on PR. Given $PS = 28$ cm, $SQ = 42$ cm, $PT = 56$ cm and $TR = 85$ cm, decide whether $ST \parallel QR$. Justify your answer.

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



Diameter = 36 cm; arc AB = 26 cm

25. For an acute angle θ , $\cot \theta = \frac{13}{16}$. Evaluate $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$.

SECTION C

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

26. (A) For an acute angle θ , $\tan \theta + \cot \theta = 14$. Find $\tan^2 \theta + \cot^2 \theta$ and $\tan^3 \theta + \cot^3 \theta$.

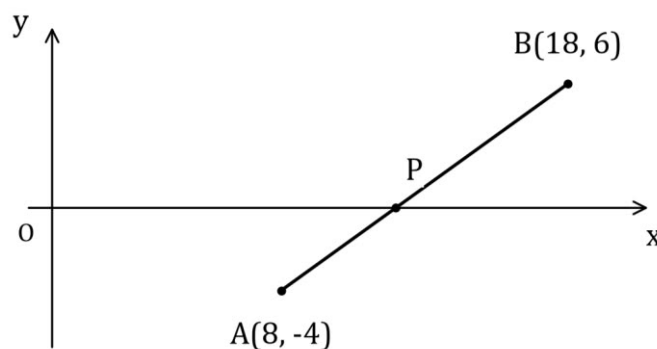
OR

(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{13}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

27. Given that $\sqrt{3}$ is irrational, prove that $12 - 5\sqrt{3}$ is irrational.

28. Find the monic quadratic polynomial whose zeroes have sum 14 and product -15. If its zeroes are α and β , also find $\alpha^2 + \beta^2$.

29. Using the coordinate diagram, in what ratio does the x-axis divide the segment joining A(8, -4) and B(18, 6)? Also find the point of division.



30. (A) The sum of the first 23 terms of an AP is 1564, and its fourth term is 28. Find its twentieth term.

OR

(B) Find the sum of all integers strictly between 21 and 260 that are divisible by 8.

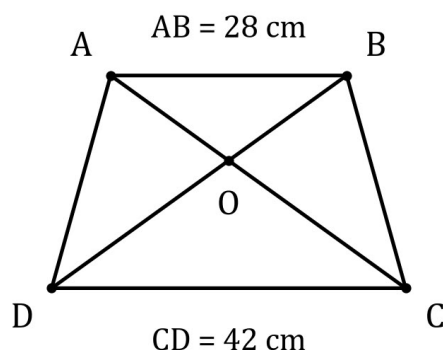
31. A chord AB of a circle of radius 65 cm has length 104 cm. The tangents at A and B meet at P on the side of AB opposite to the centre O. Find PA.

SECTION D

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

32. A fast train takes 2 hours less than a slow train to travel 1275 km. The slow train travels 10 km/h slower than the fast train. Find both speeds.

33. Using the figure, in trapezium ABCD, $AB \parallel CD$, $AB = 28$ cm and $CD = 42$ cm. Diagonals AC and BD intersect at O, with $AC = 140$ cm and $BD = 140$ cm. Prove that $\triangle AOB \sim \triangle COD$, and find AO, OC, BO and OD.

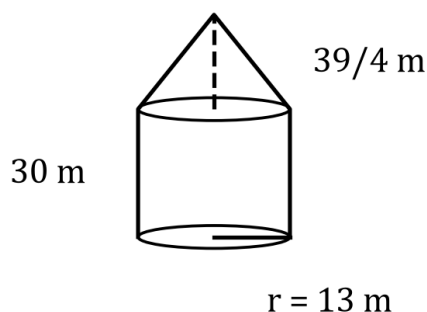


34. (A) Two points A and B lie on the same straight line with the foot O of a tower, with B between A and O. They are 32 m apart. The angles of elevation of the top are 30° at A and 60° at B. Find the height of the tower and BO. Give exact values.

OR

(B) From a window 53 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. (A) A tent has a cylindrical lower part of radius 13 m and height 30 m, with a conical roof of height $\frac{39}{4}$ m. Its base is open. Find the canvas needed, allowing an additional 21 m^2 for stitching, and its cost at ₹15 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 $\frac{13}{2}$ cm, the total length is $\frac{133}{3}$ cm, and each cone is $\frac{26}{3}$ cm high. Find the volume of air inside and the total outer surface area. Neglect sheet thickness and give exact values.

SECTION E

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

36. Tiwari Academy's maths quiz scores are grouped below for 63 students. Class intervals are continuous, with the upper endpoint excluded.

Score	0-10	10-20	20-30	30-40	40-50
Students	6	8	11	27	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.

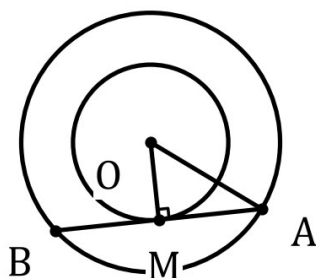
37. A taxi fare consists of a fixed fee ₹ x and a charge of ₹ y per kilometre. A 5 km journey costs ₹123 and an 8 km journey costs ₹168.

- (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. Two concentric circles have centre O and radii 60 m and 36 m. Chord AB of the outer circle 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 48 m from O . Find its length.