

Mathematics Standard

Sample Question Paper 18

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.

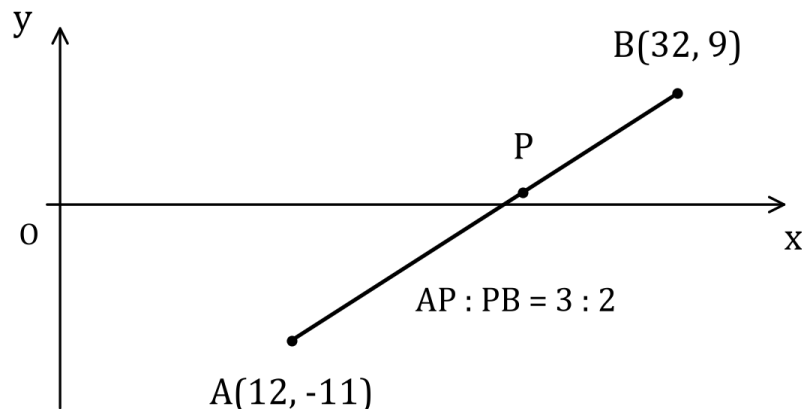
SECTION A

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

1. If $x - y = -1$ and $x + y = 37$, then (x, y) equals:

- (A) (19, 18) (B) (-18, 19)
(C) (18, -19) (D) (18, 19)

2. Using the coordinate diagram, p divides A(12, -11) and B(32, 9) internally in the ratio 3 : 2. P is:



- (A) (24, 1) (B) (25, 1)
(C) (24, 2) (D) (23, 0)

3. A bag contains 20 red, 8 blue and 4 green balls. One ball is drawn at random. The probability that it is not blue is:

- (A) $\frac{3}{4}$ (B) 0
(C) 1 (D) $\frac{5}{8}$

4. A tower of height 27 m casts a shadow of length 27 m on level ground. The angle of elevation of the Sun is:

- (A) 30° (B) 45°
(C) 60° (D) 90°

5. The distance between A(9, 25) and B(14, 30) is:

- (A) $\sqrt{54}$ units (B) 10 units
(C) 0 units (D) $\sqrt{50}$ units

6. A card is drawn at random from cards numbered 1 to 64. The probability of a perfect-square number is:

- (A) $\frac{9}{64}$ (B) $\frac{1}{8}$
(C) $\frac{7}{64}$ (D) $\frac{7}{8}$

7. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a card numbered 2 through 6, of any suit?

- (A) $\frac{21}{52}$
(B) $\frac{5}{13}$
(C) $\frac{19}{52}$
(D) $\frac{8}{13}$

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

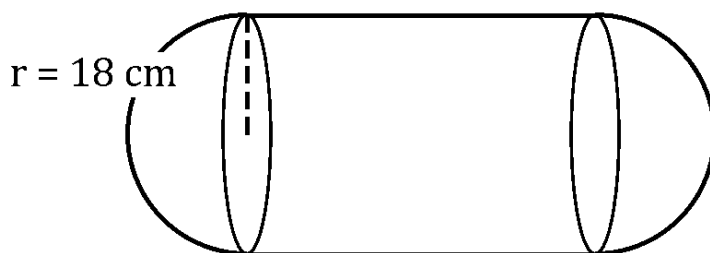
Minutes	0-10	10-20	20-30	30-40	40-50
Students	5	6	29	8	5

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

9. Which term of the AP 29, 33, 37, ... is 141?

- (A) 30 (B) 29
(C) 28 (D) 31

10. The solid shown is described as follows. A capsule has a cylindrical middle of radius 18 cm and length 21 cm, with a hemisphere of radius 18 cm at each end. Its total length is:



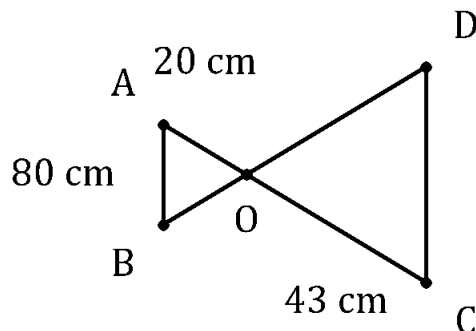
$h = 21 \text{ cm}$

- (A) 39 cm (B) 21 cm
(C) 60 cm (D) 57 cm

11. The value of $21\sec^2\theta - 21\tan^2\theta$, where defined, is:

- (A) 0 (B) 1
(C) 21 (D) 42

12. In the figure, $AB \parallel CD$ and AC and BD intersect at O . $AO = 20 \text{ cm}$, $OC = 43 \text{ cm}$ and $AB = 80 \text{ cm}$. CD is:



- (A) 172 cm (B) 176 cm
(C) 168 cm (D) 173 cm

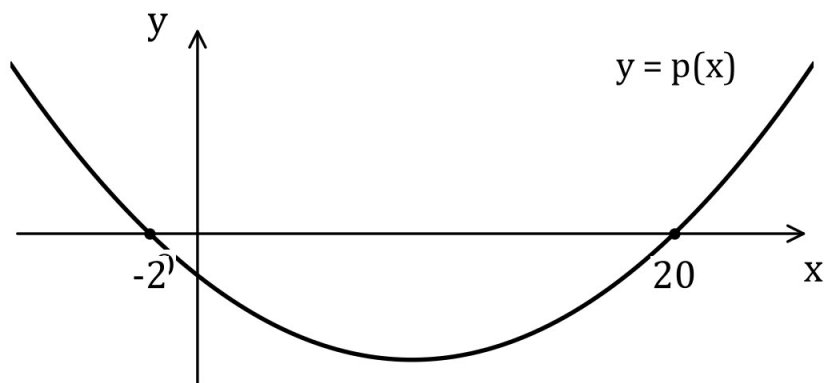
13. For $x^2 + px + 361 = 0$ to have equal roots, p must be:

- (A) 19 (B) -19
(C) ± 38 (D) 0

14. A wheel of diameter 126 cm travels $\frac{1881}{50}$ km. Its number of complete revolutions is:

- (A) 950 (B) 95000
(C) 10000 (D) 9500

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



- (A) -40
(B) -39
(C) -41
(D) -38

16. For a distribution, mean = 42 and median = 45. The estimated mode using the empirical relation is:

- (A) 54
(B) 48
(C) 51
(D) 87

17. A circle has radius 140 cm. Find the length of the arc subtending 270° at its centre.

- (A) 660 cm
(B) 330 cm
(C) 1320 cm
(D) 667 cm

18. The HCF of 80 and 140 is 20. Their LCM is:

- (A) 580
(B) 560
(C) 220
(D) 20

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 distance between $(13, -14)$ and $(25, 2)$ is 21 units.

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

20. Assertion (A): The sum of the zeroes of $x^2 - 29x - 912$ is 30.

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

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) one number is twice the other, and (ii) this event does not occur.

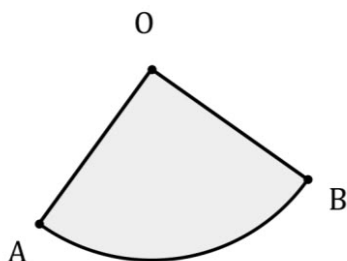
22. For an acute angle θ , $\cot \theta = \frac{19}{22}$. Evaluate $\frac{(1+\sin \theta)(1-\sin \theta)}{(1+\cos \theta)(1-\cos \theta)}$.

23. (A) Two tanks contain 700 litres and 1100 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

OR

(B) The HCF of 456 and 798 is written as $20m - 20$. Find m .

24. The shaded sector has the dimensions – diameter 48 cm and arc AB is 38 cm. Find its area.



25. (A) In $\triangle ABC$, D is on AB and E on AC, with $DE \parallel BC$. Given $AD = 21$ cm, $DB = 25$ cm and $AE = 63$ cm, find the full length AC.

OR

(B) In $\triangle PQR$, S lies on PQ and T on PR. Given $PS = 40$ cm, $SQ = 60$ cm, $PT = 80$ cm and $TR = 121$ cm, decide whether $ST \parallel QR$. Justify your answer.

SECTION C

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

26. (A) For an acute angle θ , $\tan \theta + \cot \theta = 20$. Find $\tan^2 \theta + \cot^2 \theta$ and $\tan^3 \theta + \cot^3 \theta$.

OR

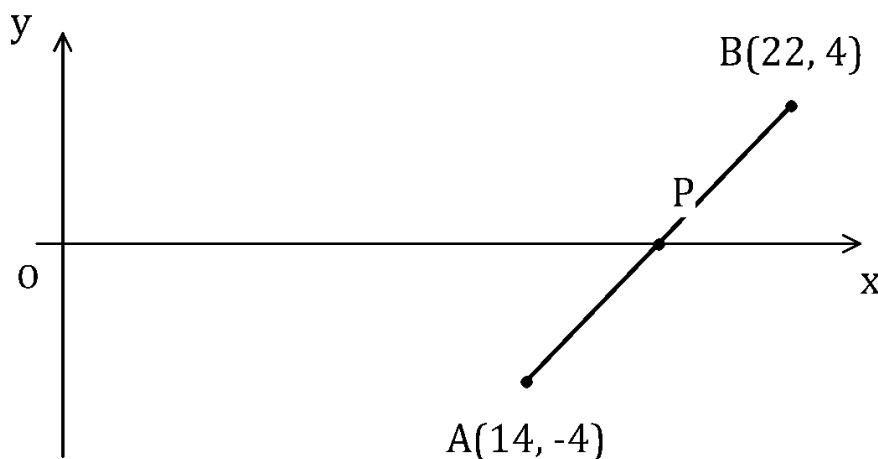
(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{19}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

27. Find the monic quadratic polynomial whose zeroes have sum 20 and product - 21. If its zeroes are α and β , also find $\alpha^2 + \beta^2$.

28. A chord AB of a circle of radius 95 cm has length 152 cm. The tangents at A and B meet at P on the side of AB opposite to the centre O. Find PA.

29. Given that $\sqrt{5}$ is irrational, prove that $18 - 3\sqrt{5}$ is irrational.

30. Using the coordinate diagram, in what ratio does the x-axis divide the segment joining A(14, -4) and B(22, 4)? Also find the point of division.



31. (A) The sum of the first 29 terms of an AP is 1769, and its fourth term is 28. Find its twentieth term.

OR

(B) Find the sum of all integers strictly between 27 and 320 that are divisible by 7.

SECTION D

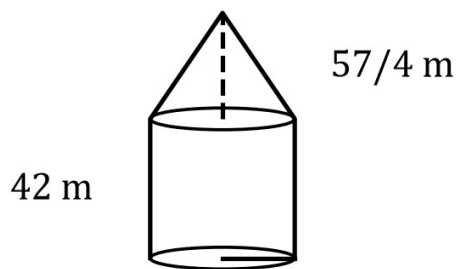
Questions 32 to 35 carry 5 marks each. ($4 \times 5 = 20$)

32. (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 44 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 71 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.

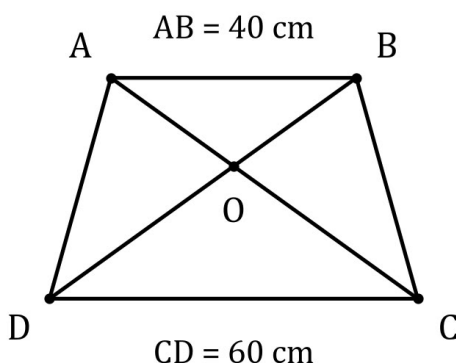
33. (A) A tent has a cylindrical lower part of radius 19 m and height 42 m, with a conical roof of height $\frac{57}{4}$ m. Its base is open. Find the canvas needed, allowing an additional 27 m^2 for stitching, and its cost at ₹21 per m^2 . Give exact values.



OR

(B) A closed thin-sheet model consists of a cylinder with a cone attached at each end. The common radius is $\frac{19}{2}$ cm, the total length is $\frac{193}{3}$ cm, and each cone is $\frac{38}{3}$ cm high. Find the volume of air inside and the total outer surface area. Neglect sheet thickness and give exact values.

34. Using the figure, in trapezium ABCD, $AB \parallel CD$, $AB = 40$ cm and $CD = 60$ cm. Diagonals AC and BD intersect at O, with $AC = 200$ cm and $BD = 200$ cm. Prove that $\triangle AOB \sim \triangle COD$, and find AO, OC, BO and OD.



35. After the price of a book is reduced by ₹5, a customer can buy 5 more books for ₹10500. 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. Tiwari Academy's maths quiz scores are grouped below for 66 students. Class intervals are continuous, with the upper endpoint excluded.

Score	0-10	10-20	20-30	30-40	40-50
Students	4	8	12	33	9

- (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.

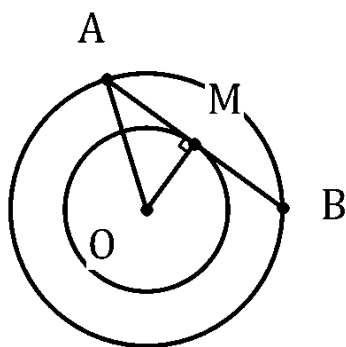
37. A taxi fare consists of a fixed fee ₹ x and a charge of ₹ y per kilometre. A 5 km journey costs ₹171 and an 8 km journey costs ₹234.

- (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 90 m and 54 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 72 m from O . Find its length.