

Mathematics Standard

Sample Question Paper 11

Class X | Code 041 | 2026-27

Time Allowed: 3 Hours

Maximum Marks: 80

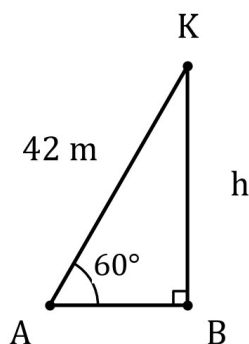
General Instructions

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. A kite is attached to a taut string of length 42 m, held at ground level. Using the angle shown, its height above the ground is:



- (A) $21\sqrt{3}$ m (B) 42 m
(C) 22 m (D) 20 m
2. In $\triangle ABC$, D lies on AB and E on AC; $DE \parallel BC$, $AD : DB = 4 : 4$ and $BC = 104$ cm. DE equals:
(A) 53 cm (B) 52 cm
(C) 54 cm (D) 104 cm
3. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a black card numbered 2, 4, 6, 8 or 10?
(A) $\frac{11}{52}$ (B) $\frac{9}{52}$
(C) $\frac{5}{26}$ (D) $\frac{21}{26}$

4. P divides A(5, -4) and B(30, 11) internally in the ratio 2 : 3. P is:

(A) (16, 2)

(B) (15, 2)

(C) (15, 3)

(D) (14, 1)

5. A card is drawn at random from cards numbered 1 to 50. The probability of a perfect-square number is:

(A) $\frac{4}{25}$

(B) $\frac{3}{25}$

(C) $\frac{7}{50}$

(D) $\frac{43}{50}$

6. An arc has length 12π cm and its sector has area 90π cm². The radius is:

(A) 15 cm

(B) 30 cm

(C) $\frac{15}{2}$ cm

(D) 17 cm

7. A bag contains 13 red, 6 blue and 3 green balls. One ball is drawn at random. The probability that it is not blue is:

(A) 0

(B) $\frac{8}{11}$

(C) 1

(D) $\frac{13}{22}$

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	4	7	22	9	4

(A) 0-10 minutes

(B) 10-20 minutes

(C) 30-40 minutes

(D) 20-30 minutes

9. For an acute angle θ , $\sin \theta = \frac{143}{145}$. Find $\cot \theta$.

(A) $\frac{143}{24}$

(B) $\frac{24}{145}$

(C) $\frac{145}{143}$

(D) $\frac{24}{143}$

10. The mean ages of men and women in a group are 50 and 34 years. The combined mean is 40 years. The percentage of women is:

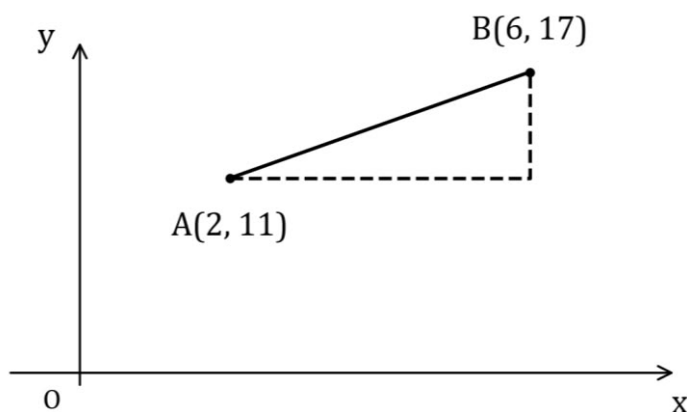
(A) 25%

(B) 50%

(C) 75%

(D) 62.5%

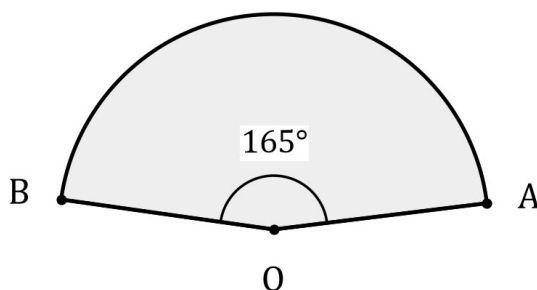
11. Using the coordinate diagram, the distance between A(2, 11) and B(6, 17) is:



- (A) $\sqrt{52}$ units
(C) 10 units

- (B) $\sqrt{56}$ units
(D) 2 units

12. In the sector diagram, a circle has radius 91 cm. Find the length of the arc subtending 165° at its centre.



- (A) $\frac{1573}{12}$ cm
(C) $\frac{1573}{3}$ cm

- (B) $\frac{1573}{6}$ cm
(D) $\frac{1615}{6}$ cm

13. If 12 is a zero of $x^2 + 3x + c$, then c equals:

- (A) 180
(C) -168

- (B) -180
(D) -192

14. The 22th term of the AP 15, 17, 19, ... is:

- (A) 59
(C) 57

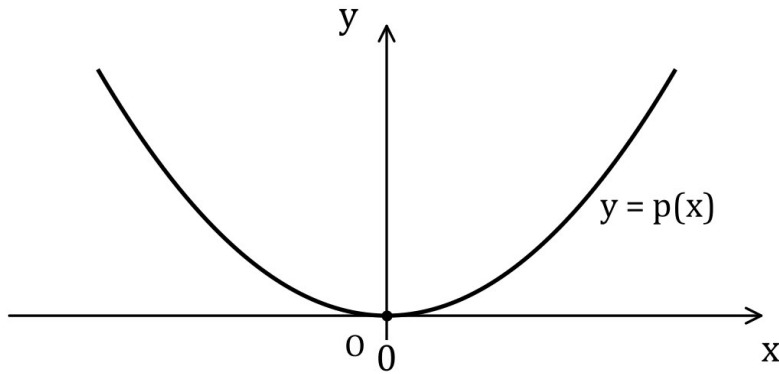
- (B) 55
(D) 61

15. A cone of radius 11 cm and height 11 cm is joined to a hemisphere of the same radius. The volume of the solid is:

- (A) $1331\pi \text{ cm}^3$
(C) $\frac{1331}{3}\pi \text{ cm}^3$

- (B) $2662\pi \text{ cm}^3$
(D) $3993\pi \text{ cm}^3$

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



- (A) -1, 1
(C) -1, 0

- (B) 0, 1
(D) 0, 0

17. The HCF of 32 and 48 is:

- (A) 17
(C) 16

- (B) 32
(D) 48

18. The lines $12x + 2y = 5$ and $36x + ky = 7$ are parallel when k is:

- (A) 6
(C) -6

- (B) 3
(D) 7

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 $x^2 - 26x + 168$ are 12 and 14.

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

20. Assertion (A): If $A(8, -7)$ and $B(t, -5)$ lie on the circle with centre $O(6, -7)$, then $t = 6$.

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

SECTION B

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

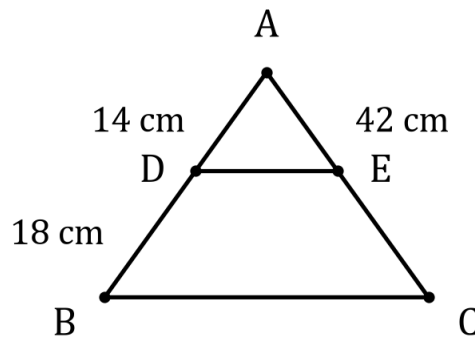
21. (A) Two tanks contain 455 litres and 715 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

OR

(B) The HCF of 288 and 504 is written as $13m - 13$. Find m .

22. Two fair dice, one red and one blue, are thrown together. Find the probability that (i) the sum is a perfect square, and (ii) this event does not occur.

23. (A) In the figure, D lies on AB and E on AC, with $DE \parallel BC$. $AD = 14$ cm, $DB = 18$ cm and $AE = 42$ cm. Find the full length AC.



OR

(B) In $\triangle PQR$, S lies on PQ and T on PR. Given $PS = 26$ cm, $SQ = 39$ cm, $PT = 52$ cm and $TR = 79$ cm, decide whether $ST \parallel QR$. Justify your answer.

24. A sector belongs to a circle of diameter 34 cm. Its corresponding arc is 24 cm long. Find the area of the sector.

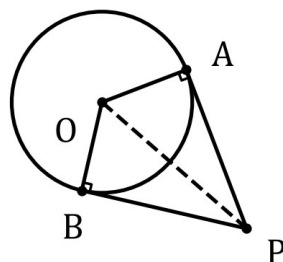
25. For an acute angle θ , $\tan \theta = \frac{4}{5}$. Find $\sin \theta$ and $\cos \theta$.

SECTION C

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

26. Find the zeroes of $2x^2 - 2x - 264$ and verify the relationships between its zeroes and coefficients.

27. PA and PB are tangents from P to the circle with centre O, as shown. $OA = 104$ cm and $OP = 221$ cm. Find PA and the perimeter of quadrilateral OAPB. State the geometric facts used.



28. Given that $\sqrt{2}$ is irrational, prove that $11 + 4\sqrt{2}$ is irrational.

29. (A) The sum of the fifth and ninth terms of an AP is 72; the sum of its seventh and twelfth terms is 92. Find the AP.

OR

(B) Find the sum of all integers strictly between 20 and 250 that are divisible by 7.

30. Find the coordinates of the points of trisection of the segment joining A(4, -6) and B(16, 6).

31. (A) For an acute angle θ , $15\sin^2\theta + 12\cos^2\theta = \frac{51}{4}$. Find $\sin^2\theta$, $\tan \theta$ and $\sec \theta$.

OR

(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{12}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

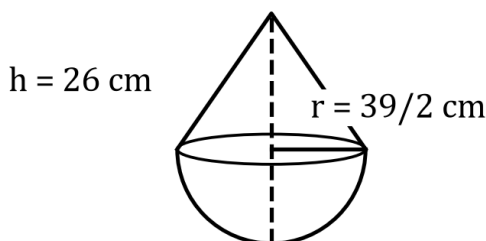
SECTION D

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

32. Two taps fill a large tank together in 22 hours. The larger tap alone takes 33 hours less than the smaller tap alone. Find the time taken by each tap to fill the tank separately.

33. In $\triangle ABC$, points D and E lie on AB and AC respectively. AD = 14 cm, DB = 16 cm, AE = 28 cm, EC = 32 cm and BC = 60 cm. Prove that $DE \parallel BC$ and $\triangle ADE \sim \triangle ABC$. Find DE and the perimeter of $\triangle ADE$.

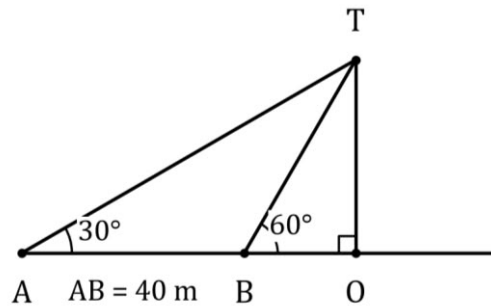
34. (A) A wooden toy is formed by a cone fixed on a hemisphere of the same radius $\frac{39}{2}$ cm. Its total height is $\frac{91}{2}$ cm. Find the exposed surface area and the cost of painting it at ₹14 per cm^2 . Give exact values.



OR

(B) A closed thin-sheet model consists of a cylinder with a cone attached at each end. The common radius is 6 cm, the total length is 41 cm, and each cone is 8 cm high. Find the volume of air inside and the total outer surface area. Neglect sheet thickness and give exact values.

35. (A) Points A, B and O lie in this order on level ground. OT is a vertical tower. $AB = 40$ m and the angles of elevation of T at A and B are 30° and 60° . Using the figure, find OT and BO in exact form.



OR

(B) From a window 50 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.

SECTION E

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

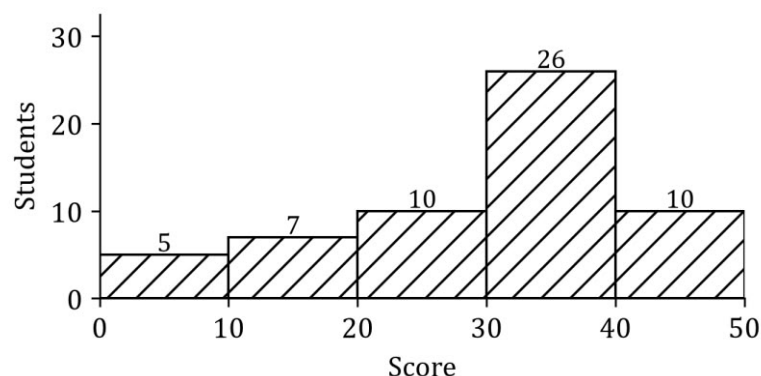
36. A school buys notebooks and pens for its mathematics club. Three notebooks and two pens cost ₹266, while two notebooks and five pens cost ₹280. Let the price of a notebook be ₹ x and that of a pen be ₹ y .

- (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. Tiwari Academy records the scores of 58 students in a mathematics quiz. The histogram gives the grouped frequency distribution. The classes are continuous, with the upper endpoint excluded from each class.



- (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.

38. A designer draws two tangents PA and PB to a circle with centre O. The radius is 13 cm and $OP = 26$ 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.