

Mathematics Standard

Sample Question Paper 7

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 card is drawn at random from cards numbered 1 to 42. The probability of a perfect-square number is:

- (A) $\frac{1}{6}$ (B) $\frac{5}{42}$
(C) $\frac{1}{7}$ (D) $\frac{6}{7}$

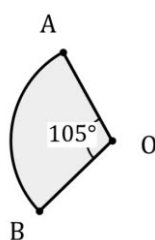
2. One card is drawn from a well-shuffled standard pack of 52 cards. What is the probability of drawing a spade or a king?

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

3. P divides A(1, 0) and B(16, 6) internally in the ratio 1 : 2. P is:

- (A) (7, 2) (B) (6, 2)
(C) (6, 3) (D) (5, 1)

4. In the sector diagram, a circle has radius 63 cm. Find the length of the arc subtending 105° at its centre.



- (A) $\frac{231}{4}$ cm (B) $\frac{231}{2}$ cm
(C) 231 cm (D) $\frac{245}{2}$ cm

5. For an acute angle θ , $\sin \theta = \frac{63}{65}$. Find $\cot \theta$.

(A) $\frac{63}{16}$

(B) $\frac{16}{65}$

(C) $\frac{65}{63}$

(D) $\frac{16}{63}$

6. The roots of $x^2 - 8x = 0$ are:

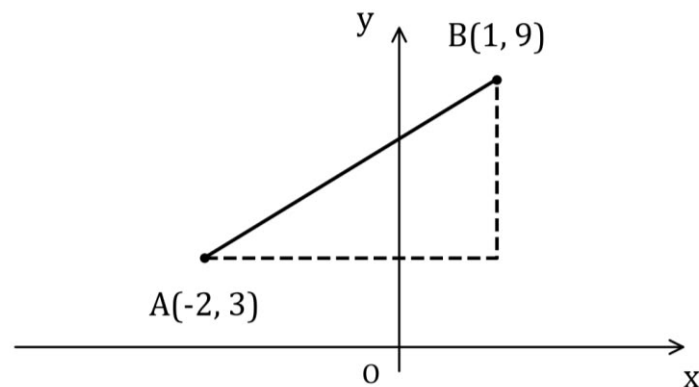
(A) 0, -8

(B) 8, -8

(C) 1, 8

(D) 0, 8

7. Using the coordinate diagram, the distance between A(-2, 3) and B(1, 9) is:



(A) $\sqrt{45}$ units

(B) $\sqrt{49}$ units

(C) 9 units

(D) 3 units

8. A bag contains 9 red, 7 blue and 2 green balls. One ball is drawn at random. The probability that it is not blue is:

(A) 0

(B) $\frac{11}{18}$

(C) 1

(D) $\frac{1}{2}$

9. The mean ages of men and women in a group are 46 and 30 years. The combined mean is 36 years. The percentage of women is:

(A) 25%

(B) 50%

(C) 75%

(D) 62.5%

10. An arc has length 8π cm and its sector has area 44π cm². The radius is:

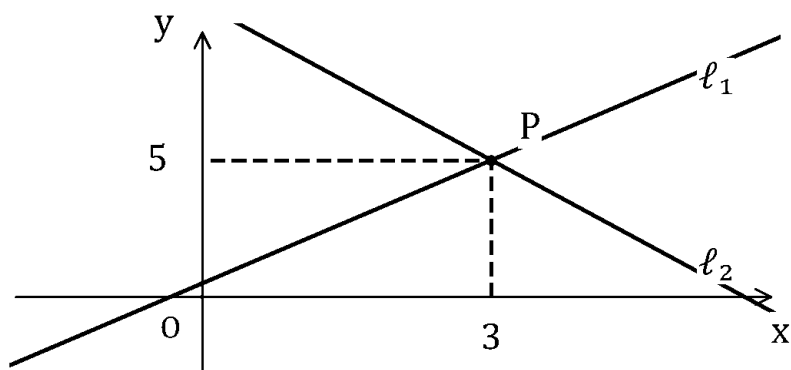
(A) 11 cm

(B) 22 cm

(C) $\frac{11}{2}$ cm

(D) 13 cm

11. The graphs of two linear equations ℓ_1 and ℓ_2 intersect at P. Using the marked projections, their solution (x, y) is:



- (A) (-3, 5) (B) (3, -5)
(C) (3, 5) (D) (-3, -5)

12. If 8 is a zero of $x^2 + 4x + c$, then c equals:

- (A) 96 (B) -96
(C) -88 (D) -104

13. A cone of radius 7 cm and height 7 cm is joined to a hemisphere of the same radius. The volume of the solid is:

- (A) $343\pi \text{ cm}^3$ (B) $686\pi \text{ cm}^3$
(C) $\frac{343}{3}\pi \text{ cm}^3$ (D) $1029\pi \text{ cm}^3$

14. The 18th term of the AP 7, 10, 13, ... is:

- (A) 61 (B) 55
(C) 58 (D) 64

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

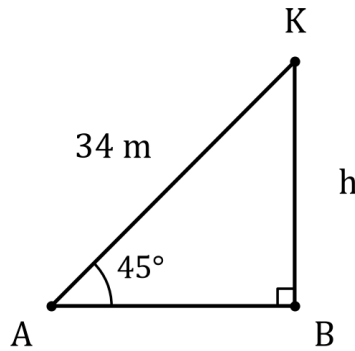
Minutes	0-10	10-20	20-30	30-40	40-50
Students	3	7	18	9	4

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

16. In $\triangle ABC$, D lies on AB and E on AC; $DE \parallel BC$, $AD : DB = 4 : 3$ and $BC = 63$ cm. DE equals:

- (A) 37 cm (B) 36 cm
(C) 38 cm (D) 63 cm

17. A kite is attached to a taut string of length 34 m, held at ground level. Using the angle shown, its height above the ground is:



- (A) $17\sqrt{2}$ m (B) 34 m
(C) 18 m (D) 16 m

18. Two runners take 14 minutes and 16 minutes to complete one lap. Starting together, after how many minutes will both next be at the starting point together?

- (A) 113 (B) 2
(C) 112 (D) 224

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): If A(5, -3) and B(t, 0) lie on the circle with centre O(2, -3), then $t = 2$.

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

20. Assertion (A): The zeroes of $x^2 - 18x + 80$ are 8 and 10.

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

SECTION B

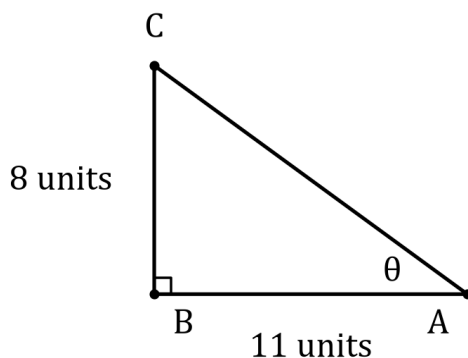
Questions 21 to 25 carry 2 marks each. ($5 \times 2 = 10$)

21. (A) Two tanks contain 315 litres and 495 litres of water. Find the greatest capacity of a container that measures either quantity an exact number of times.

OR

(B) The HCF of 192 and 336 is written as $9m - 9$. Find m .

22. In the right triangle shown, $AB = 11$ units, $BC = 8$ units and $\angle A = \theta$. Find $\sin \theta$ and $\cos \theta$.



23. A sector belongs to a circle of diameter 26 cm. Its corresponding arc is 16 cm long. Find the area of the sector.

24. Two fair dice, one red and one blue, are thrown together. Find the probability that (i) the product is a multiple of 5, and (ii) this event does not occur.

25. (A) In $\triangle ABC$, D is on AB and E on AC, with $DE \parallel BC$. Given $AD = 10$ cm, $DB = 14$ cm and $AE = 30$ cm, find the full length AC.

OR

(B) In $\triangle PQR$, S lies on PQ and T on PR. Given $PS = 18$ cm, $SQ = 27$ cm, $PT = 36$ cm and $TR = 55$ cm, decide whether $ST \parallel QR$. Justify your answer.

SECTION C

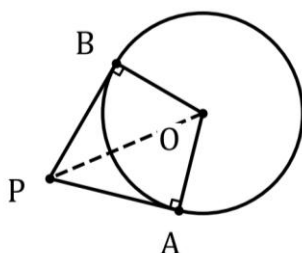
Questions 26 to 31 carry 3 marks each. ($6 \times 3 = 18$)

26. (A) The sum of the first n terms of an AP is $S_n = 7n^2 + 9n$. Find its n th term and its 18th term.

OR

(B) Find the sum of all integers strictly between 16 and 210 that are divisible by 10.

27. PA and PB are tangents from P to the circle with centre O, as shown. $OA = 27$ cm and $OP = 45$ cm. Find PA and the perimeter of quadrilateral OAPB. State the geometric facts used.



28. (A) For an acute angle θ , $\sec \theta + \tan \theta = 9$. Find $\cos \theta$, $\sin \theta$ and $\tan \theta$.

OR

(B) For an acute angle θ , $\operatorname{cosec} \theta - \cot \theta = \frac{1}{8}$. Find $\operatorname{cosec} \theta$ and $\cot \theta$.

29. Given that $\sqrt{3}$ is irrational, prove that $7 + 4\sqrt{3}$ is irrational.

30. Find the coordinates of the points of trisection of the segment joining $A(0, -2)$ and $B(12, 7)$.

31. Find the zeroes of $x^2 - x - 56$ and verify the relationships between its zeroes and coefficients.

SECTION D

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

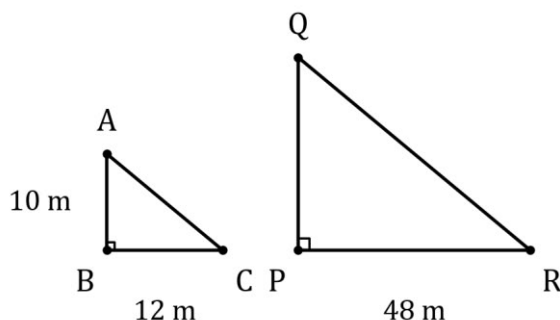
32. A fast train takes 2 hours less than a slow train to travel 600 km. The slow train travels 10 km/h slower than the fast train. Find both speeds.

33. (A) A wooden toy is formed by a cone fixed on a hemisphere of the same radius $\frac{27}{2}$ cm. Its total height is $\frac{63}{2}$ cm. Find the exposed surface area and the cost of painting it at ₹10 per cm^2 . Give exact values.

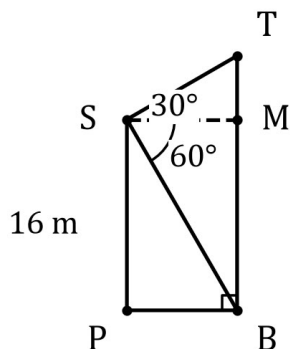
OR

(B) A closed thin-sheet model consists of a cylinder with a cone attached at each end. The common radius is 4 cm, the total length is $\frac{83}{3}$ cm, and each cone is $\frac{16}{3}$ 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, a vertical pole 10 m tall casts a shadow 12 m long. At the same time, a vertical tower casts a shadow 48 m long on level ground. Prove that the two height-and-shadow triangles are similar and find the tower height. Later, the tower shadow is 60 m long. Find the pole shadow at that later time.



35. (A) S is a point on a roof 16 m above level ground. The top T and foot B of a vertical tower are seen from S at angles of elevation 30° and depression 60° respectively. With SM horizontal, find the horizontal distance PB and tower height BT in exact form.



OR

(B) From a window 38 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 ₹190, while two notebooks and five pens cost ₹200. Let the price of a notebook be ₹x and that of a pen be ₹y.

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

OR

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

37. Tiwari Academy records the scores of 54 students in a mathematics quiz. The grouped frequency distribution is given below. The classes are continuous, with the upper endpoint excluded from each class.

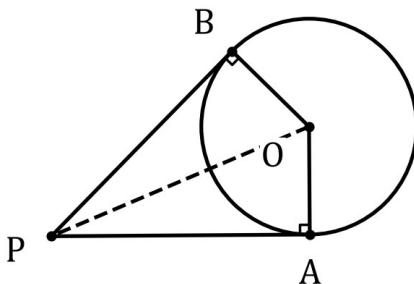
Score	0-10	10-20	20-30	30-40	40-50
Students	5	6	11	22	10

- State the modal class.
- State the median class.
- (A) Calculate the mean score, correct to two decimal places.

OR

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

38. Two straight paths PA and PB touch a circular park at A and B. Its centre is O, its radius is 35 m and $OP = 91$ m.



(i) Find $\angle OAP$.

(ii) Find PA.

(iii) (A) Find the perimeter of quadrilateral OAPB.

OR

(iii) (B) Find the area of quadrilateral OAPB.