

Mathematics

Board Exam 2023

Sample Paper No. 3

Class 10th

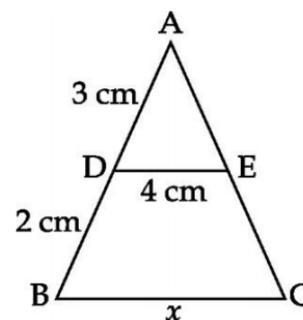
Time: 3 h

Marks: 80

Section	A	B	C	D	E
Q. No.	1 – 20	21 – 25	26 – 31	32 – 35	36 – 38
Marks	1	2	3	5	4
Type	MCQ	S. A. Type 1	S. A. Type 2	L. A. Type	Case Study Based

Section A

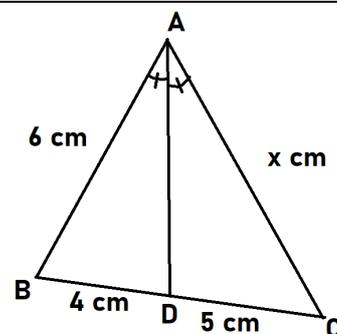
- If p and q are two co-prime numbers, then HCF (p , q) is:
 - p
 - q
 - pq
 - 1
- Which of the following is a solution of the quadratic equation $x^2 - b^2 = a(2x - a)$?
 - $a + b$
 - $2b - a$
 - ab
 - $\frac{a}{b}$
- Given that two of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ are 0, the third zero is:
 - $-\frac{b}{a}$
 - $\frac{b}{a}$
 - $\frac{c}{a}$
 - $-\frac{d}{a}$
- Which of the following pairs of equations represent inconsistent system?
 - $3x - 2y = 8$
 $2x + 3y = 1$
 - $3x - y = 8$
 $3x - y = 24$
 - $lx - y = m$
 $x + my = l$
 - $5x - y = 10$
 $10x - 2y = 20$
- The point which divides the line joining the points $A(4, -3)$ and $B(9, 7)$ in the ratio 3 : 2 is:
 - (7, 3)
 - (4, 2)
 - (5, 6)
 - (9, 4)
- In the figure given below, if $DE \parallel BC$, then x equals
 - 3 cm
 - 2 cm
 - 4 cm
 - 6.7 cm



- If $x = 2 \sin^2\theta$, $y = 2\cos^2\theta + 1$ then the value of $x + y$ is:
 - 2
 - 3
 - $\frac{1}{2}$
 - 1
- $(\sec A + \tan A)(1 - \sin A)$ is equal to:
 - $\sec A$
 - $\sin A$
 - $\operatorname{cosec} A$
 - $\cos A$
- In a $\triangle ABC$, if DE is parallel to BC , $\frac{AD}{DB} = \frac{3}{4}$ and $AC = 15$ cm, then the length AE is:
 - 45
 - $23/7$
 - 1
 - $45/7$

10. In a $\triangle ABC$ it is given that AD is internal bisector of $\angle A$. If $BD = 4$ cm, $DC = 5$ cm and $AB = 6$ cm, then AC is:

- (a) 4.5 cm (b) 8 cm (c) 9 cm (d) 7.5 cm



11. Two concentric circles are of radii 13 cm and 5 cm. The length of the chord of the larger circle which touches the smaller circle is:

- (a) 12 cm (b) 20 cm (c) 24 cm (d) 26 cm

12. The area of a circle whose circumference is 44 cm is:

- (a) 152 cm^2 (b) 153 cm^2 (c) 154 cm^2 (d) 150 cm^2

13. The volumes of two spheres are in the ratio 27 : 8. The ratio of their curved surface is:

- (a) 9 : 4 (b) 4 : 9 (c) 3 : 2 (d) 2 : 3

14. The class mark of the class 29.5 – 30.5 is:

- (a) 30 (b) 30.5 (c) 31.5 (d) 31

15. The area of circle which can be inscribed in a square of side 6 cm is:

- (a) $36 \pi \text{ cm}^2$ (b) $18 \pi \text{ cm}^2$ (c) $12 \pi \text{ cm}^2$ (d) $9 \pi \text{ cm}^2$

16. The sum of lower limit of modal class and median class of the following data is:

Class	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	25	30	16	19	17	13

- (a) 110 (b) 130 (c) 90 (d) 120

17. A bag has 5 white marbles, 8 red marbles and 4 purple marbles. If we take a marble randomly, then what is the probability of not getting purple marble?

- (a) 0.5 (b) 0.66 (c) 0.08 (d) 0.77

18. If $\cot \theta = \frac{7}{8}$, then $\tan^2 \theta$ equals to:

- (a) $\frac{8}{7}$ (b) $\frac{49}{64}$ (c) $\frac{64}{49}$ (d) $\frac{7}{8}$

DIRECTION: In the question number 19 and 20, a statement of **assertion (A)** is followed by a statement of **Reason (R)**. Choose the correct option.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

19. **Assertion (A):** The distance of a point $P(x, y)$ from origin is $\sqrt{x^2 - y^2}$.

Reason (R): If $P(-1, 1)$ is the mid-point of the line segment joining $A(-3, b)$ and $B(1, b + 4)$, then value of b is -1 .

20. **Assertion (A):** $n^2 - n$ is divisible by 2 for every positive integer.

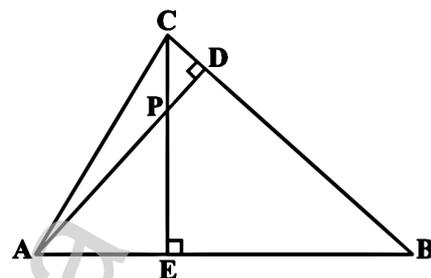
Reason (R): $\sqrt{2}$ is not a rational number.

Section B

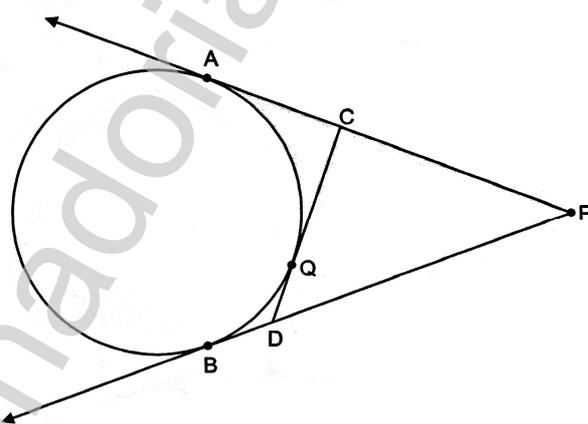
21. For what value of k will the following system of linear equations has no solution?

$$(k + 1)x + y = 1, 3x + (k - 1)y = 2k + 5$$

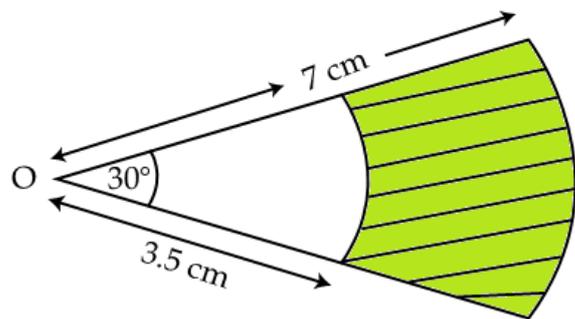
22. In Fig. given, altitudes AD and CE of $\triangle ABC$ intersect each other at the point P. Show that: $\triangle AEP \sim \triangle CDP$



23. In figure, PA and PB are the tangents to the circle drawn from an external point P, CD is a third tangent touching the circle at Q. If $PB = 7$ cm and $CQ = 2.5$ cm, find the length of CP.



24. In fig., sectors of two concentric circles of radii 7 cm and 3.5 cm are given. Find the area of shaded region. $\left(\pi = \frac{22}{7}\right)$

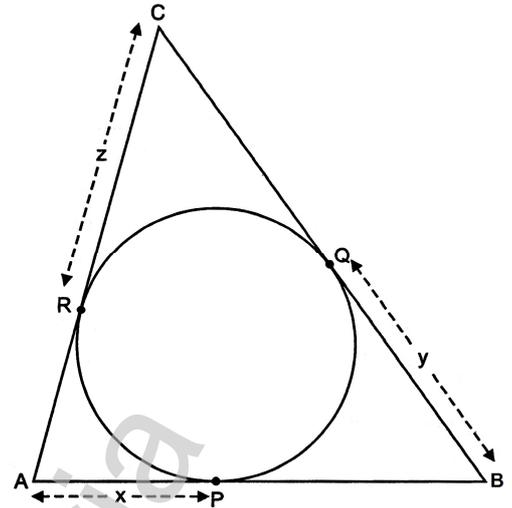


25. Evaluate: $\frac{\sin 30^\circ + 2 \cos^2 45^\circ + \tan^2 60^\circ}{\frac{1}{2} \cot 45^\circ + \cos^2 30^\circ + \tan^2 45^\circ}$.

Section C

26. Prove that $\sqrt{6} + \sqrt{2}$ is irrational.
27. Find the zeroes of the quadratic polynomial $4x^2 + 5\sqrt{2}x - 3$ by factorisation method and verify the relation between the coefficients and the zeroes of the polynomial.
28. For what values of a and b does the following pair of linear equations have an infinite number of solutions?
 $2x + 3y = 7; (a - b)x + (a + b)y = 3a + b - 2$.
29. Prove that: $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$.

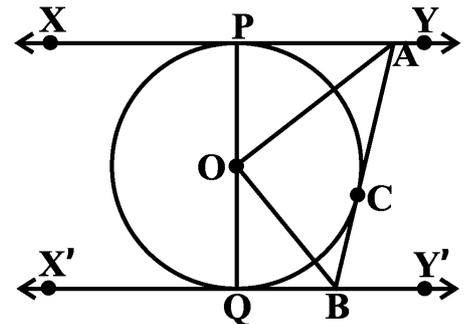
30. A circle is inscribed in a $\triangle ABC$ having sides $AB = 10$ cm, $BC = 14$ cm and $CA = 12$ cm as shown in figure. The circle touches the sides AB , BC and CA at points P , Q and R respectively. If $AP = x$, $BQ = y$ and $CR = z$, find x , y and z .



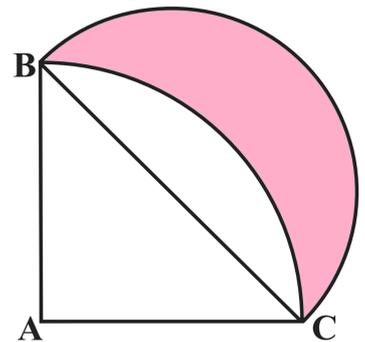
31. (a) A box contains cards numbered 11 to 123. A card is drawn at random from the box. Find the probability that the number on the drawn card is a square number.
 (b) A box contains 12 balls of which some are red in colour. If 6 more red balls are put in the box and a ball is drawn at random, the probability of drawing a red ball doubles than what it was before. Find the number of red balls in the bag.

Section D

32. In given figure XY and $X'Y'$ are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and $X'Y'$ at B . Prove that $\angle AOB = 90^\circ$.



33. In the given figure, ABC is a quadrant of a circle of radius 14 cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.



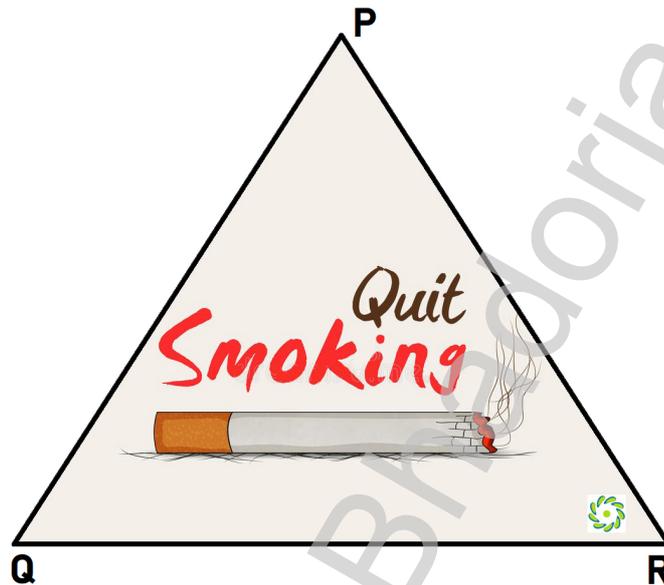
34. The mean of the following frequency distribution is 52. Find the missing frequency f .

Class Interval	Frequency
10 – 20	5
20 – 30	3
30 – 40	4
40 – 50	f
50 – 60	2
60 – 70	6
70 – 80	13

35. Check graphically whether the pair of linear equations $4x - y - 8 = 0$ $2x - 3y + 6 = 0$ is consistent. Also, find the vertices of the triangle formed by these lines with the x-axis.

Section E

36. To raise social awareness about hazards of smoking, a school decided to start 'No smoking' campaign. 10 students are asked to prepare campaign banners in the shape of a triangle. The vertices of one of the triangle are P(-3, 4), Q(3, 4) and R(-2, -1).



Based on this information, answer the following questions:

- (a) If A be the mid-point of QR, then the coordinates of A. (1 mark)
 (b) Find the length of the median PA. (1 mark)
 (c) Find the coordinates of centroid of ΔPQR . (2 marks)
37. Anuj wants to participate in a 200 m race. He can currently run that distance in 51 seconds and with each day of practice it takes him 2 seconds less. He wants to do in 31 seconds.



- (a) Write an AP which expresses the given situation. (1 mark)
 (b) What is the minimum number of days he needs to practice till his goal is achieved? (1 mark)
 (c) What time will he be clocking on the 5th day and on the 7th day? (2 marks)

38. A straight highway leads to the foot of a tower. A boy named Dhruv is standing at the top of the tower. He observes his friend Garvit is driving a car which is approaching the foot of the tower with a uniform speed.



At any moment, the angle of depression of the car is 30° . Six seconds later, the angle of depression of the car becomes 60° . Find the time taken by the car to reach the foot of the tower from this point.



Words of Wisdom

Great minds discuss ideas; average minds discuss events; small minds discuss people.

- Eleanor Roosevelt

Answers and solutions to this paper are available on our android app.

To download free android app click here:

<https://play.google.com/store/apps/details?id=co.rogers.kfiox>

More sample papers with solutions, video lectures and other material included on app.



Or, go to: <https://kfiox.courses.store/>