

# CBSE QUESTION PAPER

## CLASS-X

### MATHS

SECTION - A

**Question 1:** The HCF of two numbers is 145 and their LCM is 2175. If one number is 725, then the other number is

- (a) 415
- (b) 425
- (c) 435
- (d) 445

**Question 2:** If the pair of linear equations  $2x + 3y = 7$  and  $2\alpha x + (\alpha + \beta)y = 28$  has infinitely many solutions, then the values of  $\alpha$  and  $\beta$  are:

- (a) 3 and 5
- (b) 4 and 8
- (c) 4 and 7
- (d) 4 and 5

**Question 3:**

In  $\triangle ABC$ ,  $D$  and  $E$  are points on the sides  $AB$  and  $AC$  respectively such that

$DE \parallel BC$ . if  $\frac{AD}{DB} = \frac{2}{3}$  and  $AC = 18\text{cm}$ , then  $AE$  is equal to

- (a) 5.2 cm
- (b) 6.2 cm
- (c) 7.2 cm
- (d) 8.2 cm

**Question 4:** The lines representing the linear equations  $2x - y = 3$  and  $4x - y = 5$

- (a) Intersect at a point
- (b) Are parallel
- (c) Are coincident
- (d) Intersect at exactly two points

**Question 5:** Construction of a cumulative frequency table is useful in determining the

- (a) Mean
- (b) Mode
- (c) Median
- (d) All the above three measures

**Question 6:** If  $x = 3$ ,  $\sec^2 \theta - 1$ ,  $y = \tan^2 \theta - 2$  then  $x - 3y$  is equal to

- (a) 3
- (b) 4
- (c) 5
- (d) 8

**Question 7: If HCF (96, 404) = 4, then LCM (96, 404) is**

- (a) 9626
- (b) 9696
- (c) 9656
- (d) 9676

**Question 8:**

**If the pair of linear equations  $10x + 5y - (k - 5) = 0$  and  $20x + 10y - k = 0$  have infinitely many solutions, then the value of k is**

- (a) 2
- (b) 11
- (c) 10
- (d) 8

**Question 9:**

**If  $\tan \theta = \frac{2}{3}$ , then the value of  $\frac{(2 + 2 \sec \theta)(1 - \sec \theta)}{(2 + 2 \operatorname{cosec} \theta)(1 - \operatorname{cosec} \theta)}$  is**

- (a)  $\frac{81}{16}$
- (b)  $\frac{16}{81}$
- (c)  $\frac{75}{16}$
- (d)  $\frac{77}{16}$

**Question 10: If  $\sin \theta + \sin^2 \theta = 1$ , then the value of  $\cos^2 \theta + \cos^4 \theta$  is**

- a) 2
- b) 1
- c) -2
- d) -1

SECTION - B

Question 11:

If the product of zeroes of the polynomial  $ax^2 - 6x - 6$  is 4, find the value of 'a'.

Question 12:

Check whether  $6^n$  can end with the digit 0 for any natural number n.

Question 13:

Prove that:  $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2 \theta$ .

OR

Find acute angles A and B, if

$$\sin(A + 2B) = \frac{\sqrt{3}}{2} \text{ and } \cos(A + 4B) = 0, A > B$$

Question 14:

2 tables and 3 chairs together cost ₹ 3500 whereas 3 tables and 2 chairs together cost ₹4000. Find the cost of a table and a chair.

Question 15 :

Two poles of height 10 m and 15 m stand vertically on a plane ground. If the distance between their feet is  $5\sqrt{3}m$ , find the distance between their tops.

Question 16:

In figure, two triangles ABC and DBC are on the same base BC in which  $\angle A = \angle D = 90^\circ$ .

If CA and BD meet each other at E, show that  $AE \times CE = BE \times ED$ .

**Question 17:**

<i>Marks obtained</i>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
<i>Number of students</i>	5	18	30	45	40	15	10	7

**Question 18:**

Given below is the distribution of marks obtained by 229 students:

<i>Marks</i>	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	<i>Total</i>
<i>Number of students</i>	12	30	34	65	45	25	18	229

Write the above distribution as more than type cumulative frequency distribution.

SECTION - C

**Question 19:**

Prove that  $\sqrt{3} + \sqrt{5}$  is an irrational number

OR

Prove that  $5 + \sqrt{2}$  is an irrational number

**Question 20**

Use Euclid's division algorithm to find the HCF of 10224 and 9648.

**Question 21**

Solve for x and y

$$4x + \frac{y}{3} = \frac{8}{3}$$

$$\frac{x}{2} + \frac{3y}{4} = -\frac{5}{2}$$

**OR**

The sum of the numerator and the denominator of a fraction is 8. If 3 is added to both the numerator and the denominator, the fraction becomes  $\frac{3}{4}$ . Find the fraction.

**Question 22:**

If  $\alpha$  and  $\beta$  the zeroes of the quadratic polynomial  $f(x) = ax^2 + bx + c$ , then evaluate

$$(i) \frac{1}{a\alpha + b} + \frac{1}{a\beta + b}$$

$$(ii) a \left[ \frac{\alpha^2}{\beta} + \frac{\beta^2}{\alpha} \right] + b \left[ \frac{\alpha}{\beta} + \frac{\beta}{\alpha} \right]$$

**Question23:**

A triangle has sides 5 cm, 12 cm and 13 cm. Find the length to one decimal place, of the perpendicular from the opposite vertex to the side whose length is 13 cm.

**Question 24:**

$$\tan^2 A + \cot^2 A = \sec^2 A \operatorname{cosec}^2 A - 2$$

Question 25:

$$\sqrt{\frac{\sec \theta - 1}{\sec \theta + 1}} + \sqrt{\frac{\sec \theta + 1}{\sec \theta - 1}} = 2 \operatorname{cosec} \theta$$

Question 26:

Calculate area ( $\Delta PQR$ ) from figure

Question 27. In a retail market, fruit vendor were selling mangoes kept in packing boxes. These boxes contained varying numbers of mangoes. The following was the distribution of mangoes according to the number of boxes.

Number of mangoes	Number of boxes
50-52	15
53-55	110
56-58	135
59-61	115
62-64	25

Find the mean number of mangoes kept in a packing box, using step-deviation method.

Or

The following distribution shows the daily pocket allowance of children of a locality. The mean pocket allowance is ? 18. Find the value of p.

Daily pocket allowance In rs	11-13	13-15	15-17	17-19	19-21	21-23	23-25
Number of children	7	6	9	13	p	5	4

SECTION - D

**29. Solve the following system of equations graphically and find the vertices of the triangle formed by these lines and the x-axis.**

$$4x - 3y + 4 = 0, 4x + 3y - 20 = 0$$

**30. The following table shows the ages of 100 persons of a locality.**

Age(years)	Number of person
0-10	5
10-20	15
20-30	20
30-40	23
40-50	17
50-60	11
60-70	9

**Draw the less than ogive and find the median.**



**Question 31. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.**

**OR**

**Prove that, in a right triangle, the square of the hypotenuse is equal to the sum of squares of the other two sides.**

**Question 32:**

*Prove that* 
$$\frac{\cot \theta - 1 + \operatorname{cosec} \theta}{\cot \theta + 1 - \operatorname{cosec} \theta} = \frac{1}{\operatorname{cosec} \theta - \cot \theta}$$

**OR**

**If  $\tan \theta + \sin \theta = m$  and  $\tan \theta - \sin \theta = n$ , show that**

$$(m^2 - n^2)^2 = 16mn$$

**Question 33:**

**If  $x = \cot A + \cos A$  and  $y = \cot A - \cos A$ , show that  $x^2 - y^2 = 4\sqrt{xy}$ .**

**Question 34: The Median of the following data is 20.75. Find the missing frequencies x and y, if the total frequency is 100**

<b>Class interval</b>	<b>Frequency</b>
0 – 5	7
5 – 10	10
10 – 15	x
15 – 20	13
20 – 25	Y
25 – 30	10
30 – 35	14
35 – 40	9