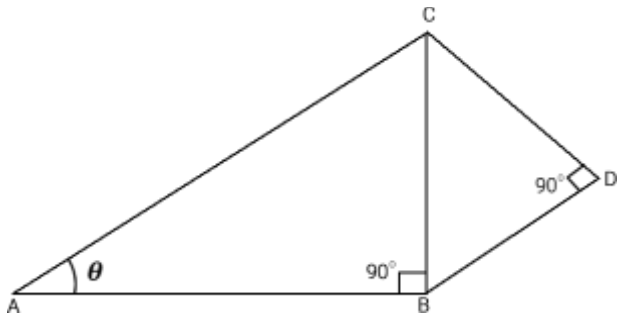
CBSE QUESTION PAPER
CLASS-X
MATHS

SECTION - A

Question 1: In figure, AB = $5\sqrt{3}\ cm$, $DC = 4cm$, $BD = 3cm$, $then$ tan θ is



(a) $\frac{1}{\sqrt{3}}$

(b) $\frac{2}{\sqrt{3}}$

(c) $\frac{4}{\sqrt{3}}$

(d) $\frac{5}{\sqrt{3}}$

Question 2: In figure, what values of x will make $DE \parallel AB$?

(a) 3
(b) 2
(c) 5
(c) 4

Question 3: Find the LCM and HCF of 510 and 92 and verify that LCM × HCF = product of the two numbers

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

a) 0
b) 1
c) 2
d) -1

Question 5: If $\Delta ABC \cong \Delta RQP$, $\angle A = 80°$ *and* $\angle B = 60°$, *the value of* $\angle P$ is

(a) $80°$
(b) $30°$
(c) $40°$
(d) $50°$

Question 6: In the give figure, $\angle ACB = 90°$ and $\angle BDC = 90°, CD = 4cm, BD = 3cm, AC = 12cm, \cos A - \sin A$ $is\ equal\ to$

$(a).\ \frac{5}{12}$

$(b).\ \frac{5}{13}$

$(c).\ \frac{7}{13}$

$(d).\ \frac{7}{12}$

Question 7: If $\tan 2A = \cot(A - 18°)$, Where 2A is an acute angle, then the value of A is

(a) $24°$
(b) $63°$
(c) $40°$
(d) $36°$

Question 8: If $\sec x + \tan x = p$, $then$ $\sec x$ $is\ equal\ to$

$(a)\ \frac{P^2 - 1}{p}$

$(b)\ \frac{P^2 + 1}{p}$

$(c)\ \frac{P^2 - 1}{2p}$

$(d)\ \frac{P^2 + 1}{2p}$

Question 9: The largest number that will divide 398, 436 and 542 leaving remainder 7,11 and 15 respectively is

(a) 11
(b) 17
(c) 34
(d) 51

Question 10: If $\cos x = \cos 60° \cos 30° + \sin 60° \sin 30°$, then the value of x is

(a) $90°$

(b) $45°$

(c) $30°$

(d) $60°$

SECTION – B

Question 11: If α and β are the zeroes of the quadratic polynomial $p(x) = ax^2 + bx + c$, then evaluate:

$$\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$$

Question 12: Check whether 6^n can end with the digit 0 for any natural number n.

Question 13:

$$\frac{\cos\theta}{1 + \sin\theta} = \frac{1 - \sin\theta}{\cos\theta}$$

OR

Prove that: (i) $\tan 20°\tan 35°\tan 45°\tan 55°\tan 70° = 1$

(ii) $\sin 48°\sec 42° + \operatorname{cosec} 42° = 2$

(iii) $\dfrac{\sin 70°}{\cos 20°} + \dfrac{\operatorname{cosec} 20°}{\sec 70°} - 2\cos 70° \operatorname{cosec} 20° = 0$

Question 14: Reena has pens and pencils which together are 40 in number. If she has 5 more pencils and 5 less pens, then number of pencils would become 4 times the number of pens. Find the original number of pens and pencils.

Question 15: In figure, $AB \perp BC$, $DE \perp AC$ and $GF \perp BC$, therefore $ADE \sim \Delta GCF$

Question 16:

$$\frac{2x}{x-4}+\frac{2x-5}{x-3}=\frac{25}{3}$$

Question 17: The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality.

Monthly consumption (in units)	$65-85$	$85-105$	$105-125$	$125-145$	$145-165$	$165-185$	$185-205$
Number of consumers	4	5	13	20	14	8	4

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

Question 18: The length of 42 leaves of a plant are measure correct up to the nearest millimeter and the data is as under:

Length (in mm)	$118-126$	$126-134$	$134-142$	$142-150$	$150-158$	$158-166$
Number of leaves	4	5	10	14	4	5

Find the mode length of the leaves.

SECTION – C

Question 19: Prove that $\frac{7}{3}\sqrt{5}$ is irrational number.

OR

Prove that $5 - 2\sqrt{3}$ is an irrational number

Question 20: Prove that $n^2 - n$ dis divisible by 2 for any positive integer n.

Question 21: Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?

OR

Solve the following pair of equations:

$$\frac{10}{x+y} + \frac{2}{x-y} = 4$$

$$\frac{15}{x+y} - \frac{5}{x-y} = -2$$

Question 22: If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - px + q$, prove that

$$\frac{\alpha^2}{\beta^2} + \frac{\beta^2}{\alpha^2} = \frac{p^4}{q^2} - \frac{4p^2}{q} + 2$$

Question 23: In an isosceles triangle ABC, AB = AC = 25 cm, BC = 14 cm. Calculate the altitude from A on BC.

Question 24:

$$\frac{\cos\theta}{1+\sin\theta} = \frac{1-\sin\theta}{\cos\theta}$$

Question 25:

$$\frac{1-\sin\theta}{1+\sin\theta}-(\sec\theta-\tan\theta)^2$$

OR

$$\frac{\text{Tan}\,45^\circ}{\text{cosec}\,30^\circ}+\frac{\text{Sec}\,60^\circ}{\cot 45^\circ}-\frac{5\sin 90^\circ}{2\,\text{Cos}\,0^\circ}$$

Question 26:

In Figure, XY||QR, $\frac{PQ}{XQ}=\frac{7}{3}$ $and\ PR=6.3cm.\ Find\ YR.$

Question 27. Find mean of the following frequency distribution using step-deviation method:

Class-Interval	0-60	60-120	120-180	180-240	240-300
Frequency	22	35	44	25	24

OR

The mean of the following distribution is 52.5 find the value of p.

Classes	**0-20**	**20-40**	**40-60**	**60-80**	**80-100**
Frequency	**15**	**22**	**37**	**p**	**21**

Question 28. A survey regarding the height (in cm) of 51 girls of class X of a school was conducted and the following data was obtained:

Height (in cm)	**Number of girls**
less than 140	**4**
less than 145	**11**
less than 150	**29**
less than 155	**40**
less than 160	**46**
less than 165	**51**

Find the median height.

SECTION – D

Question 29: If the median of the distribution given below is 28.5, find the values of x and y, if the total frequency is 60.

Class interval	**0-10**	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**	**Total**
Frequency	**5**	**x**	**20**	**15**	**y**	**5**	**60**

Question 30: If tan A - n tan B and sin A - m sin B, prove that $\boldsymbol{cos^2\, A = \frac{m^2-1}{n^2-1}}$

OR

Prove the identity:

$$\sqrt{\frac{1+sin\theta}{1-sin\theta}} + \sqrt{\frac{1-sin\theta}{1+sin\theta}} = 2\, sec\, \theta$$

Question:31: Find all zeroes of the polynomial $f(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$, if it's tho zeroes are $-\sqrt{\frac{3}{2}}.and\ \sqrt{\frac{3}{2}}$

Question: 32

$$\frac{\tan\theta}{1-\cot\theta} = \frac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta$$

Question 33.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.

Question34: Prove that in a triangle, if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points the other two sides are divided in the same ratio

OR

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