

CYCLE TEST
CLASS XI
MATHEMATICS

General Instructions

Question No. 1 to 4 each carries 1 mark.

Question No. 5 to 9 each carries 4 mark.

Question No. 10 carries 6 marks.

Q1) In ΔABC , what is the value of $a(b \cos C - c \cos B)$ in terms of a, b and c .

Q2) Find the radian measure corresponding to $-37^{\circ}30'$.

Q3) If the arcs of the same lengths in two circles subtend angles 65° and 110° at the center, find the ratio of their radii.

Q4) If $\sec x = -2$ and $\pi < x < \frac{3\pi}{2}$, then what is the value of $\sin x$?

Q5) Prove the following

$$\sqrt{\frac{1+\sin x}{1-\sin x}} = \tan\left(\frac{\pi}{4} + \frac{x}{2}\right)$$

Q6) Prove that following by using the principle of mathematical induction for all $n \in N$

$$\frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \dots + \frac{1}{(3n-2)(3n+1)} = \frac{n}{3n+1}$$

Q7) Prove that $\cos 20^{\circ} \cos 40^{\circ} \cos 60^{\circ} \cos 80^{\circ} = \frac{1}{16}$

OR

Prove that
$$\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$$

Q8) Draw the graph of the function $f(x) = -2\cos 3x$. Also find its domain, range, period.

(Graph on sheet only)

Q9) Prove that following by using the principle of mathematical induction for all $n \in N$

$3^{2n+2} - 8n - 9$ is divisible by 8.

Q10) Find the general solution of following equations:

i) $2\cos^2 x + 3\sin x = 0$

ii) $\tan \theta \tan 2\theta = 1$