



INDIAN SCHOOL AL WADI AL KABIR

Dept. of Mathematics

HOLIDAY HOME WORK

Class XI(2016-17)

Questions

Section A(1 mark)

S.No

Answers

1. Simplify $\frac{1+3i}{1-2i}$ -1 + i
2. Find the argument of $\frac{1}{1-i}$ $\frac{\pi}{4}$
3. Find the general solution of $\cos\left(x + \frac{\pi}{4}\right) = 0$.
4. Express $\frac{i^2+i^4+i^6+i^7}{1+i^2+i^3}$.
5. If the ordered pairs $(a, -1)$ and $(5, b)$ belong to $\{(x, y): y = 2x - 3\}$,
Find the values of a and b .

Section B(Long Answer)

6. Prove: $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = \frac{1}{16}$
7. Prove that $\tan 70^\circ = \tan 20^\circ + 2 \tan 50^\circ$
8. Prove that $\sin \alpha + \sin\left(\alpha + \frac{2\pi}{3}\right) + \sin\left(\alpha + \frac{4\pi}{3}\right) = 0$.
9. Prove that $\cos^2 A + \cos^2(A + 240^\circ) + \cos^2(A - 240^\circ) = \frac{3}{2}$
10. Prove: $\frac{\cos 8A \cos 5A - \cos 12A \cos 9A}{\sin 8A \cos 5A + \cos 12A \sin 9A} = \tan 4A$
11. In any ΔABC , prove that:
 $a \sin(B - C) + b \sin(C - A) + c \sin(A - B) = 0$
12. Show that $2 \cos^6 \theta = 64 \cos^6 \theta - 96 \cos^4 \theta + 36 \cos^2 \theta$
13. Find the domain and range of $f(x) = \sqrt{x-5}$
14. Prove that $a \cos A + b \cos B + c \cos C = 2a \sin B \sin C$.
16. Prove : $\frac{\sin 3x + \sin 5x + \sin 7x + \sin 9x}{\cos 3x + \cos 5x + \cos 7x + \cos 9x} = \tan 6x$

17. Show that $\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$.
18. Prove: $\frac{(\cos \theta - \cos 3\theta)(\sin 8\theta + \sin 2\theta)}{(\sin 5\theta - \sin \theta)(\cos 4\theta - \cos 6\theta)} = 1$
19. If $f(x) = \frac{1+x}{1-x}$, show that $\frac{f(x)f(x^2)}{1+[f(x)]^2} = \frac{1}{2}$.
20. Prove that :

$$\cos \alpha + \cos \beta + \cos \gamma + \cos(\alpha + \beta + \gamma) = 4 \cos\left(\frac{\alpha+\beta}{2}\right) \cos\left(\frac{\beta+\gamma}{2}\right) \cos\left(\frac{\gamma+\alpha}{2}\right)$$
21. Is $g = \{(1,1), (2,3), (3,5), (4,7)\}$ a function? If this is described by the formula $g(x) = ax + b$
 Then what should be the values assigned to a and b .
22. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 men and only three men got medals in all the three sports .How many received medals in exactly two of the three sports. 9
23. Solve $2\cos^2 x + 3\sin x = 0$
24. In ΔABC , prove that $\sin \frac{B-C}{2} = \frac{b-c}{a} \cos \frac{A}{2}$
25. Prove that $\left(1 + \cos \frac{\pi}{8}\right) \left(1 + \cos \frac{3\pi}{8}\right) \left(1 + \cos \frac{5\pi}{8}\right) \left(1 + \cos \frac{7\pi}{8}\right) = \frac{1}{8}$
26. Find the general solution of the following equation: $\sqrt{3} \cos x - \sin x = 1$ $x = n\pi \pm \frac{\pi}{2}$,
 $n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$
27. In any triangle ABC, prove that $a = b \cos C + c \cos B$
28. Solve the following trigonometric equation: $2\sin^2 x + \sin^2 2x = 2$ $x = n\pi \pm \frac{\pi}{2}$,
 $n\pi \pm \frac{\pi}{4}, n \in \mathbb{Z}$
29. Find the general solution of the following equation:
 $3 \tan x + \cot x = 5 \operatorname{cosec} x$ $2n\pi \pm \frac{\pi}{3}, n \in \mathbb{Z}$
30. Evaluate $\left| \frac{1+i}{1-i} - \frac{1-i}{1+i} \right|$.