



Since 2015

WEEKLY TEST-5

MATHEMATICS

CLASS-XI

TRIGONOMETRIC FUNCTION, COMPLEX NUMBER



Since 2022

DATE:- 20.07.2025

SECTION-A

MCQ TYPE:-

[1×20=20]

- If $4x + i(3x - y) = 3 + i(-6)$, where x and y are real numbers, then find the values of x and y respectively.
(a) $1/4, 3/4$ (b) $3/4, 33/4$ (c) $33/4, -3/4$ (d) $-3/4, -33/4$
- The value of $(-\sqrt{-1})^{4n+3}$, $n \in \mathbb{N}$ is
(a) 1 (b) -1 (c) i (d) $-i$
- $(-i)(2i)\left(-\frac{1}{8}i\right)^3 =$
(a) $0+i$ (b) $0-i$ (c) $\frac{1}{256}+0i$ (d) $0+\frac{1}{256}i$
- If $(x + iy)(2 - 3i) = 4 + i$, then values of x, y are
(a) 1, $3/13$ (b) 2, $5/13$ (c) $\frac{5}{13}, \frac{14}{13}$ (d) 0, 2
- $\left| (1+i)\left(\frac{2+i}{3+i}\right) \right|$ is equal to
(a) $-\frac{1}{2}$ (b) 1 (c) -1 (d) $\frac{1}{2}$
- Express $\frac{5+\sqrt{2}i}{1-\sqrt{2}i}$ in the form of $a + ib$.
(a) $1-2\sqrt{2}i$ (b) $1-\sqrt{2}i$ (c) $1+2\sqrt{2}i$ (d) $1+\sqrt{2}i$
- If α and β are different complex numbers with $|\beta|=1$, then $\left| \frac{\beta-\alpha}{1-\overline{\alpha}\beta} \right|$ is
(a) 0 (b) $3/2$ (c) $1/2$ (d) 1

8. Solve for $y: 2y^2 + 6y + \frac{17}{2} = 0$.
- (a) $\frac{3}{2} \pm i\sqrt{2}$ (b) $-\frac{3}{2} \pm i\sqrt{2}$ (c) $\frac{1}{2} \pm i\sqrt{2}$ (d) $-\frac{1}{2} \pm i\sqrt{2}$
9. The square root of i is
- (a) $\pm \frac{1}{\sqrt{2}}(-1+i)$ (b) $\pm \frac{1}{\sqrt{2}}(1+i)$ (c) $\pm \frac{1}{\sqrt{2}}(1-i)$ (d) None of these
10. $\sqrt{2}i$ is equal to
- (a) $1+i$ (b) $1-i$ (c) $-\sqrt{2}i$ (d) None of these
11. 330°
- (a) $\frac{\pi}{6}$ (b) $\frac{5\pi}{12}$ (c) $\frac{11\pi}{6}$ (d) $\frac{\pi}{8}$
12. Find the value of $\sin 20^\circ \sin 40^\circ \sin 80^\circ$
- (a) $\frac{\sqrt{3}}{8}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{\sqrt{3}}{4}$ (d) $\sqrt{3}$
13. The value of $\sec \frac{2\pi}{3} + \operatorname{cosec} \frac{5\pi}{6}$ is equal to
- (a) 2 (b) -2 (c) 4 (d) 0
14. If $A + B = \frac{5\pi}{4}$, then value of $(1 + \tan A)(1 + \tan B)$ equals
- (a) 1 (b) 2 (c) -2 (d) -1
15. The value of x in $(0, \pi/2)$ satisfying the equation $\sin x \cos x = \frac{1}{4}$ is
- (a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{8}$ (d) $\frac{\pi}{12}$
16. If $\sin \theta + \operatorname{cosec} \theta = 2$, then $\sin^2 \theta + \operatorname{cosec}^2 \theta$ is equal to
- (a) 1 (b) 4 (c) 2 (d) None of these
17. Which of the following is not correct ?
- (a) $\sin \theta = -\frac{1}{5}$ (b) $\cos \theta = 1$ (c) $\sec \theta = \frac{1}{2}$ (d) $\tan \theta = 20$
18. The value of $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ$ is
- (a) $\frac{1}{2}$ (b) 1 (c) $-\frac{1}{2}$ (d) $\frac{1}{8}$

19. If $\tan A = \frac{1}{2}$, $\tan B = \frac{1}{3}$, then $\tan(2A + B)$ is equal to

- (a) 1 (b) 2 (c) 3 (d) 4

20. The value of $\sin \frac{\pi}{10} \sin \frac{13\pi}{10}$ is

- (a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) $-\frac{1}{4}$ (d) 1

SECTION-B

SHORT ANSWER TYPE:-

[2×5=10]

1. Prove that :

$$\tan\left(\frac{\pi}{4} + \theta\right) + \tan\left(\frac{\pi}{4} - \theta\right) = 2 \sec 2\theta$$

2. Prove that :

$$\frac{\sin A \cdot \sin 2A + \sin 3A \cdot \sin 4A}{\sin A \cdot \cos 2A + \sin 3A \cdot \cos 4A} = \tan 4A$$

3. If $\sin \theta + \sin \phi = a$ and $\cos \theta + \cos \phi = b$ then prove that :

$$\cos(\theta + \phi) = \frac{b^2 - a^2}{b^2 + a^2}$$

4. If $4x + i(3x - y) = 3 + i(-6)$, where x and y are real numbers, then find the values of x and y respectively.

5. If $z_1 = 2 + 3i$ and $z_2 = 1 + 2i$. Then $\frac{z_1}{z_2}$ is equal to

6. Find the conjugate of $\frac{(3 - 2i)(2 + 3i)}{(1 + 2i)(2 - i)}$.

SECTION-D

LONG ANSWER TYPE:-

[5×4=20]

1. Find $\sin 18^\circ$

2. Prove that:

$$\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x + \frac{2\pi}{3}\right) = \frac{3}{2}$$

3. Prove that:

$$\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$$

4. Square root of $-5-12i$.

5. Prove that : $\sqrt{2 + \sqrt{2 + 2\cos 4x}} = 2\cos x, 0 < x < \frac{\pi}{4}$

