

Matemática 12º ano

Trigonometria : Formulas trigonométricas-----Prof. Mónica Pinto

$$\sin(a \pm b) = \sin a \cos b \pm \sin b \cos a \quad \cos(a \pm b) = \cos a \cos b \mp \sin a \sin b$$

1. Tendo em conta que $\frac{7\pi}{12} = \frac{\pi}{3} + \frac{\pi}{4}$, determina o valor de $\sin \frac{7\pi}{12}$.

Sol. $\frac{\sqrt{6} + \sqrt{2}}{4}$

2. Determina o valor de $\sin \frac{5\pi}{12} \times \sin \frac{\pi}{12}$.

Sol. $\frac{1}{4}$

3. Considera as funções de domínio \mathbb{R} definidas por:

$$f(x) = 3 \sin x - 3\sqrt{3} \cos x \quad \text{e} \quad g(x) = 2 \cos x + 2 \sin x$$

Determina a e b , sabendo que

a. $f(x) = a \sin(x - b)$

b. $f(x) = a \cos(x - b)$

Sol. a. $a = 6$ b. $a = 2\sqrt{2}$ b. $b = \frac{\pi}{4}$

4. Resolve, em \mathbb{R} , cada uma das equações:

a. $\sin \frac{\pi}{7} \cos x + \cos \frac{\pi}{7} \sin x = -\frac{1}{2}$

c. $\cos x + \sqrt{3} \sin x = -\sqrt{2}$

b. $\sqrt{2} \sin x + \sqrt{2} \cos x = 1$

d. $\sqrt{3} \cos x - \sin x = 0$

sol. a. $\left\{-\frac{13}{42}\pi + 2k\pi, \frac{43}{42}\pi + 2k\pi, k \in \mathbb{R}\right\}$ b. $\left\{-\frac{1}{12}\pi + 2k\pi, \frac{7}{12}\pi + 2k\pi, k \in \mathbb{R}\right\}$ c. $\left\{-\frac{5}{12}\pi + 2k\pi, \frac{13}{12}\pi + 2k\pi, k \in \mathbb{R}\right\}$

d. $\left\{\frac{1}{3}\pi + k\pi, k \in \mathbb{R}\right\}$

5. Mostra que $\sin(3x) = 3 \sin x - 4 \sin^3 x$ e $\cos 3x = 4 \cos^3 x - 3 \cos x$.

6. Calcula $\sin 2x$, $\cos 2x$, $\tan 2x$ sabendo que $\cos x = \frac{3}{5}$ e $x \in \left[0, \frac{\pi}{2}\right]$.

Sol. $\frac{25}{24}$, $-\frac{7}{25}$, $-\frac{24}{7}$