Resoluções

Capítulo 6

Relações trigonométricas – Seno e cosseno de um arco trigonométrico

ATIVIDADES PARA SALA

01 I. a) $\text{sen } 420° = \text{sen } 60° = \dfrac{\sqrt{3}}{2}$

b) $\text{sen } \dfrac{13\pi}{4} = \text{sen } \dfrac{5\pi}{4} = -\text{sen } \dfrac{\pi}{4} = -\dfrac{\sqrt{2}}{2}$

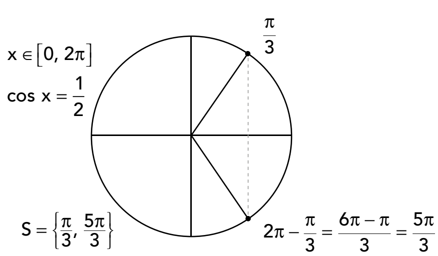
c) $\text{sen } \dfrac{17\pi}{3} = \text{sen } \dfrac{5\pi}{3} = -\text{sen } \dfrac{\pi}{3} = -\dfrac{\sqrt{3}}{2}$

d) $\text{sen } (-150°) = \text{sen } 210° = -\text{sen } 30° = -\dfrac{1}{2}$

II. $x = \dfrac{4\pi}{3}$ rad ou $x = \dfrac{5\pi}{3}$ rad

02 $A = \text{sen } 45° - 3 \text{ sen } \pi + \dfrac{\text{sen } 270°}{4} = \dfrac{\sqrt{2}}{2} - \dfrac{1}{4} = \dfrac{2\sqrt{2} - 1}{4}$

03 Pela condição dada, tem-se o seguinte:



04 $\dfrac{\cos 300° \cdot \cos 30°}{\cos 45°} = \dfrac{\dfrac{1}{2} \cdot \dfrac{\sqrt{3}}{2}}{\dfrac{\sqrt{2}}{2}} = \dfrac{\sqrt{3}}{4} \cdot \dfrac{\cancel{2}}{\cancel{\sqrt{2}}} \cdot \dfrac{\sqrt{2}}{\cancel{\sqrt{2}}} = \dfrac{\sqrt{6}}{4}$

05 $\left(-\dfrac{\sqrt{3}}{2} + \dfrac{3}{2}\right) \cdot 1 = \dfrac{3 - \sqrt{3}}{2}$

ATIVIDADES PROPOSTAS

01 $3 \cdot \dfrac{1}{2} + 6 \cdot \dfrac{\sqrt{3}}{2} + 2 \cdot \dfrac{\sqrt{2}}{2} + 4 \cdot 1 = \dfrac{11 + 6\sqrt{3} + 2\sqrt{2}}{2}$

02 a) $\text{sen } \pi = 0$

b) $\text{sen } 315° = -\text{sen } 45° = -\dfrac{\sqrt{2}}{2}$

c) $\text{sen } (-720°) = \text{sen } 0° = 0$

d) $\cos 315° = \cos 45° = \dfrac{\sqrt{2}}{2}$

e) $\cos 400\pi = \cos 0° = 1$

f) $\cos (-2\,700°) = \cos 180° = -1$

03 $\text{sen } \dfrac{7\pi}{6} < \text{sen } \pi = \text{sen } 0 = \text{sen } 2\pi < \text{sen } \dfrac{3\pi}{4} < \text{sen } \dfrac{\pi}{2}$

04 $x = 90°$ ou $x = -270° \Rightarrow$ Soma $= -180°$ ou $-\pi$ rad

05 $N = \dfrac{\left(-\dfrac{1}{2}\right) \cdot \dfrac{1}{2} + \left(1 + \dfrac{\sqrt{3}}{2}\right) \cdot \dfrac{\sqrt{3}}{2}}{\left(-\dfrac{1}{2}\right) \cdot \dfrac{\sqrt{3}}{2} - \left(1 + \dfrac{\sqrt{3}}{2}\right) \cdot \dfrac{1}{2}} = -1$

06 I. $P = \text{sen } 10° \cdot \text{sen } 211° \cdot \text{sen } 4\,397° \cdot \text{sen } (-10°)$

$$\begin{array}{r|l} 4\,397° & 360° \\ \hline 4\,320° & 12 \\ \hline 77° & \end{array}$$

$\text{sen } 4\,397° = \text{sen } 77°$

$\text{sen } (-10°) = -\text{sen } 10°$

Portanto, tem-se

$P = (+) \cdot (-) \cdot (+) \cdot (-) = +$ (positivo)

II. **D**

$\text{sen } x = \dfrac{4k - 13}{3} \Rightarrow -1 \leq \dfrac{4k - 13}{3} \leq 1 \Rightarrow \dfrac{5}{2} \leq k \leq 4$

07 **C**

$\cos x = \dfrac{2 - 4\mathbb{N}}{3}$

$-1 \leq \dfrac{2 - 4\mathbb{N}}{3} \leq 1 \Rightarrow -3 \leq 2 - 4\mathbb{N} \leq 3 \Rightarrow$

$\Rightarrow -5 \leq -4\mathbb{N} \leq 1 \Rightarrow -\dfrac{1}{4} \leq \mathbb{N} \leq \dfrac{5}{4}$

08 **C**

cos x = –1 torna 3 – cos x o maior possível: $\frac{1}{3-(-1)} = \frac{1}{4}$.

09 **B**

$$\frac{-a^2+(a-b)^2+2ab}{b^2} = \frac{\cancel{-a^2} + \cancel{a^2} - \cancel{2ab} + b^2 + \cancel{2ab}}{b^2} = 1$$

10 I. **B**

$$-1 \le \frac{2x^2-3}{5} \le 1 \Rightarrow -5 \le 2x^2 - 3 \le 5 \Rightarrow -2 \le 2x^2 \le 8 \Rightarrow$$

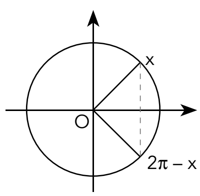
$$\underbrace{-1 \le x^2}_{(*)} \underbrace{\le 4}_{(**)}$$

* $x^2 + 1 \ge 0 \Rightarrow \forall x \in \mathbb{R}$

** $x^2 - 4 \le 0 \Rightarrow -2 \le x \le 2$

$(*) \cap (**) \Rightarrow -2 \le x \le 2$

II.



Soma = x + 2π – x = 2π