

Resoluções

Capítulo 10

Redução ao 1º quadrante



ATIVIDADES PARA SALA

- 01** a) $\frac{(-\operatorname{sen} x) \cdot (-\operatorname{sen} x)}{(-\operatorname{tg} x) \cdot (-\operatorname{cos} x)} = \frac{\operatorname{sen}^2 x}{\operatorname{sen} x} = \operatorname{sen} x$
- b) $\frac{(\operatorname{sen} x) \cdot (-\operatorname{cotg} x)}{(-\operatorname{tg} x) \cdot (-\operatorname{sen} x)} = \frac{-\operatorname{cos}^2 x}{\operatorname{sen}^2 x} = -\operatorname{cotg}^2 x$
- c) $\frac{\frac{1}{-\operatorname{cos} x} \cdot \left(\frac{-\operatorname{cos} x}{\operatorname{sen} x}\right)}{\frac{1}{\operatorname{sen} x} \cdot \left(\frac{-\operatorname{cos} x}{\operatorname{sen} x}\right)} = \frac{\frac{1}{\operatorname{sen} x}}{\frac{-\operatorname{cos} x}{\operatorname{sen}^2 x}} = \frac{1}{\operatorname{sen} x} \cdot \left(\frac{-\operatorname{sen}^2 x}{\operatorname{cos} x}\right) = -\operatorname{tg} x$
- d) $(-\operatorname{csc} x) + \operatorname{csc} x + \operatorname{cotg} x = \operatorname{cotg} x$

02 $\frac{\operatorname{cos} x \cdot \operatorname{sen} x}{\operatorname{sen} x \cdot (-\operatorname{cos} x)} = -1$

03 $A + B = \frac{(-\operatorname{sen} x) \cdot (-\operatorname{cos} x)}{\operatorname{sen} x \cdot (-\operatorname{cos} x)} + \frac{(-\operatorname{sen} x) - \operatorname{cos} x}{(-\operatorname{sen} x) - \operatorname{cos} x} = -1 + 1 = 0$

04 **A**
 $\operatorname{sen}\left(\frac{\pi}{2} - x\right) \cdot \operatorname{cos}\left(\frac{\pi}{2} - x\right) = \operatorname{sen} x \cdot \operatorname{cos} x$

05 **A**
 $\frac{\operatorname{sen} x \cdot \operatorname{sen} x}{(-\operatorname{tg} x) \cdot (-\operatorname{cos} x)} = \frac{\sqrt{3}}{2} \Rightarrow \frac{\operatorname{sen}^2 x}{\operatorname{sen} x} = \frac{\sqrt{3}}{2} \Rightarrow$
 $\operatorname{sen} x = \frac{\sqrt{3}}{2} \Rightarrow |\operatorname{cos} x| = \frac{1}{2}$



ATIVIDADES PROPOSTAS

01 a) $\frac{(-\operatorname{cos} x) \cdot (\operatorname{cos} x)}{\operatorname{sen} x \cdot (-\operatorname{sen} x)} = \operatorname{cotg}^2 x$

b) $\frac{(-\operatorname{sen} x) \cdot \operatorname{csc} x}{\operatorname{csc} x \cdot \operatorname{sen} x} = -1$

02 **C**
 $\operatorname{sen} x + \operatorname{cos}\left(\frac{\pi}{2} - x\right) = \operatorname{sen} x + \operatorname{sen} x = 1$

- 03** a) $\operatorname{sen}(-330^\circ) = -\operatorname{sen} 330^\circ = -(-\operatorname{sen} 30^\circ) = \operatorname{sen} 30^\circ = \frac{1}{2}$
- b) $\operatorname{sec}(-240^\circ) = \operatorname{sec} 240^\circ = \frac{1}{\operatorname{cos} 240^\circ} = \frac{1}{-\operatorname{cos} 60^\circ} = \frac{1}{-\frac{1}{2}} = -2$
- c) $\operatorname{tg}(-960^\circ) = -\operatorname{tg} 960^\circ = -\operatorname{tg} 240^\circ = -\operatorname{tg} 60^\circ = -\sqrt{3}$
- d) $\operatorname{cotg}(-1200^\circ) = -\operatorname{cotg} 1200^\circ = -\operatorname{cotg} 120^\circ =$
 $-(-\operatorname{cotg} 60^\circ) \Rightarrow \operatorname{cotg} 60^\circ = \frac{1}{\operatorname{tg} 60^\circ} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
- e) $\operatorname{cos}(-45^\circ) = \operatorname{cos} 45^\circ = \frac{\sqrt{2}}{2}$
- f) $\operatorname{cosec}(-60^\circ) = -\operatorname{cosec} 60^\circ = \frac{-1}{\operatorname{sen} 60^\circ} \Rightarrow$
 $\frac{-1}{\frac{\sqrt{3}}{2}} = \frac{-2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$

04 **B**
 $\operatorname{sen}\left(x - \frac{\pi}{2}\right) = -\operatorname{sen}\left(\frac{\pi}{2} - x\right) = -\operatorname{cos} x = -\frac{3}{5}$

05 **A**
 $\operatorname{sen}(\pi + \alpha) - \operatorname{sen}(-\alpha) = -\operatorname{sen} \alpha + \operatorname{sen} \alpha = 0$

06 **D**
 $\operatorname{cos} 45^\circ + 2 \operatorname{sen} 90^\circ - \operatorname{tg} 315^\circ = \frac{\sqrt{2}}{2} + 2 + 1 = \frac{\sqrt{2}}{2} + 3 = \frac{\sqrt{2} + 6}{2}$

07 Pela condição dada, tem-se:

$$\operatorname{sen} x = \frac{1}{5}$$

$$\operatorname{cos}\left(\frac{\pi}{2} - y\right) = \operatorname{sen} y$$

$$x + y = 90^\circ$$

$$y = 90^\circ - x$$

$$\operatorname{sen} y = \operatorname{sen}(90^\circ - x)$$

$$\operatorname{sen} y = \operatorname{cos} x$$

$$\operatorname{sen}^2 x + \operatorname{cos}^2 x = 1$$

$$\left(\frac{1}{5}\right)^2 + \operatorname{cos}^2 x = 1$$

$$\frac{1}{25} + \operatorname{cos}^2 x = 1$$

$$\operatorname{cos}^2 x = 1 - \frac{1}{25} = \frac{25 - 1}{25} = \frac{24}{25}$$

$$\cos x = \frac{\sqrt{24}}{5} = \frac{2\sqrt{6}}{5}$$

$$\operatorname{sen} y = \frac{2\sqrt{6}}{5}$$

$$\text{Portanto: } \cos\left(\frac{\pi}{2} - y\right) = \operatorname{sen} y = \frac{2\sqrt{6}}{5}.$$

08 B

$$\frac{2(\operatorname{sen}^2 20^\circ + \cos^2 20^\circ)(\operatorname{sen}^2 20^\circ - \cos^2 20^\circ) \cdot \operatorname{cosec}^4 20^\circ}{3(1 - \cotg^2 20^\circ)(1 + \cotg^2 20^\circ)} =$$

$$= \frac{2(\operatorname{sen}^2 20^\circ - \cos^2 20^\circ) \cdot \operatorname{cosec}^4 20^\circ}{3\left(\frac{\operatorname{sen}^2 20^\circ - \cos^2 20^\circ}{\operatorname{sen}^2 20^\circ}\right) \cdot \operatorname{cosec}^2 20^\circ} = \frac{2}{3}$$

09 A

Como $\cos\left(\frac{\pi}{2} - \alpha\right) = \operatorname{sen} \alpha$, tem-se:

$$\frac{\operatorname{sen} \alpha + \operatorname{tg} \alpha - \cos\left(\frac{\pi}{2} - \alpha\right)}{\cotg \alpha} = \frac{\cancel{\operatorname{sen} \alpha} + \operatorname{tg} \alpha - \cancel{\operatorname{sen} \alpha}}{\cotg \alpha} = \frac{\operatorname{tg} \alpha}{\frac{1}{\operatorname{tg} \alpha}} =$$

$$= \operatorname{tg} \alpha \cdot \operatorname{tg} \alpha = \operatorname{tg}^2 \alpha = \left(\operatorname{tg} \frac{\pi}{6}\right)^2 = \left(\frac{\sqrt{3}}{3}\right)^2 = \frac{3}{9} = \frac{1}{3}$$

10 E

$$\cos 225^\circ + \operatorname{tg}(-240^\circ) = -\frac{\sqrt{2}}{2} - \sqrt{3} = -\left(\sqrt{3} + \frac{\sqrt{2}}{2}\right)$$