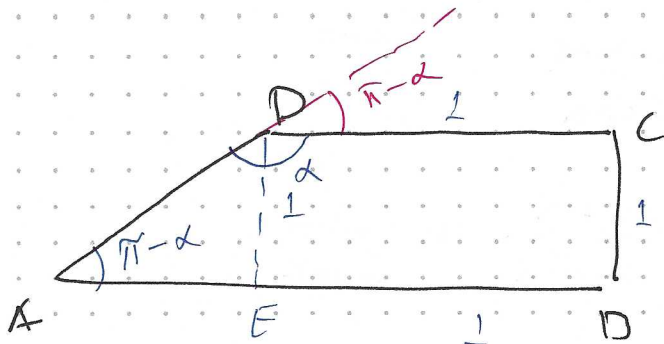


TRIGONOMETRIA

EXERCÍCIOS EXAMES / TESTES INTERMEDIÁRIOS 2

1.1



$$\begin{aligned} P(\alpha) &= \overline{AB} + \overline{CD} + \overline{BC} + \overline{AD} \\ &= \overline{AE} + \overline{ED} + \overline{BC} + \overline{CD} + \overline{DA} \\ &= 3 + \overline{AE} + \overline{DA} \end{aligned}$$

$$\text{Sen}(\pi - \alpha) = \frac{\overline{DE}}{\overline{AD}} \Leftrightarrow \overline{AD} = \frac{1}{\text{Sen}(\pi - \alpha)}$$

$$\overline{AD} = \frac{1}{\text{Sen} \alpha}$$

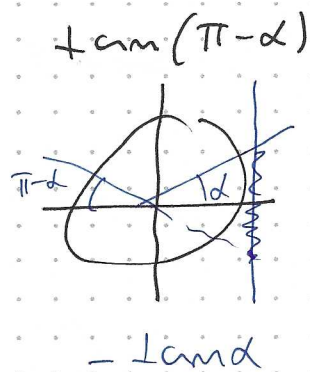
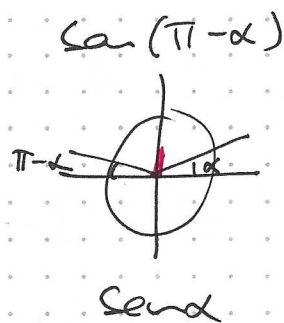
$$\text{tan}(\pi - \alpha) = \frac{\overline{DE}}{\overline{AE}} \Leftrightarrow$$

$$\Leftrightarrow -\text{tan} \alpha = \frac{1}{\overline{AE}}$$

$$\Leftrightarrow \overline{AE} = -\frac{1}{\text{tan} \alpha}$$

Assim

$$P(\alpha) = 3 - \frac{1}{\text{tan} \alpha} + \frac{1}{\text{Sen} \alpha}$$



$$P(\alpha) = 3 - \frac{1}{\tan \alpha} + \frac{1}{\sin \alpha} =$$

$$= 3 - \frac{1}{\frac{\sin \alpha}{\cos \alpha}} + \frac{1}{\sin \alpha} =$$

$$= 3 - \frac{\cos \alpha}{\sin \alpha} + \frac{1}{\sin \alpha}$$

$$= 3 - \frac{\cos \alpha + 1}{\sin \alpha}$$

$$= 3 + \frac{1 - \cos \alpha}{\sin \alpha} \quad \text{c. a. m.}$$

1.2 $\tan \theta = -\sqrt{2}$, $\theta \in]\frac{\pi}{2}, \pi[$ $P(\theta) = ?$

$$\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta} \Leftrightarrow (-\sqrt{2})^2 + 1 = \frac{1}{\cos^2 \theta} \Leftrightarrow$$

$$\Leftrightarrow 2 + 1 = \frac{1}{\cos^2 \theta} \Leftrightarrow 3 = \frac{1}{\cos^2 \theta} \Leftrightarrow \cos^2 \theta = \frac{1}{3}$$

$$\theta \in]\frac{\pi}{2}, \pi[, \cos \theta < 0 \text{ então } \cos \theta = -\sqrt{\frac{1}{3}} \Leftrightarrow$$

$$\Leftrightarrow \cos \theta = -\frac{1}{\sqrt{3}}$$

$$\sin^2 \theta = 1 - \cos^2 \theta \Leftrightarrow \sin^2 \theta = 1 - \left(-\frac{1}{\sqrt{3}}\right)^2 \Leftrightarrow$$

$$\Leftrightarrow \sin^2 \theta = 1 - \frac{1}{3} \Leftrightarrow$$

$$\Leftrightarrow \sin^2 \theta = \frac{2}{3}, \theta \in]\frac{\pi}{2}, \pi[$$

$$\Leftrightarrow \sin \theta = \sqrt{\frac{2}{3}} \quad \sin \theta > 0$$

$$\Leftrightarrow \csc \theta = \frac{\sqrt{3}}{2}$$

$$\text{Per Lema 2.0} \quad P(\theta) = 3 + \frac{1 - (-\frac{1}{3})}{\frac{2\sqrt{2}}{3}}$$

$$= 3 + \frac{\frac{4}{3}}{\frac{2\sqrt{2}}{3}} =$$

$$= 3 + \frac{42}{2\sqrt{2}} =$$

$$= \frac{3\sqrt{2} + 2}{\sqrt{2}} =$$

$$= \frac{6 + 2\sqrt{2}}{2} = 3 + \sqrt{2}$$

$$2.1 \quad A_{[OPQR]} = \frac{\overline{PQ} + \overline{OR}}{2} \times \overline{QR}$$

$$P(\cos \alpha, \sin \alpha)$$

Como $\alpha \in]\frac{\pi}{2}, \pi[$

$$\cos \alpha < 0 \quad \text{e} \quad \sin \alpha > 0$$

$$\overline{OR} = -\cos \alpha$$

$$\overline{PQ} = -2 \cos \alpha$$

$$\overline{QR} = \sin \alpha$$

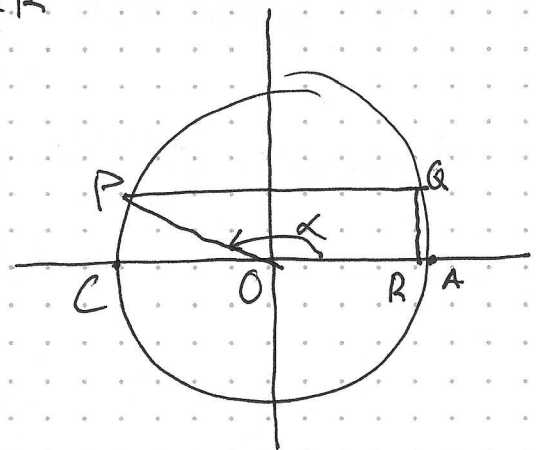
Assim

$$A_{[OPQR]} = \frac{-2 \cos \alpha + (-\cos \alpha)}{2} \sin \alpha$$

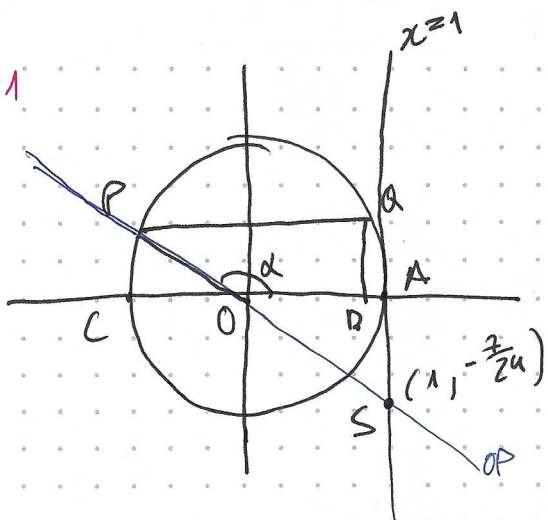
$$= \frac{-3 \cos \alpha}{2} \sin \alpha =$$

$$= -\frac{3}{2} \sin \alpha \cos \alpha \quad \text{c.c.m.}$$

3



2.1



$$x=1 \text{ ordenada } \bar{c} = -\frac{7}{24}$$

$$\text{Assim } S\left(1, -\frac{7}{24}\right)$$

$$\text{Logo } \bar{c}$$

$$\tan \alpha = -\frac{7}{24}$$

$$\tan^2 \alpha \neq 1 = \frac{1}{\cos^2 \alpha} \Leftrightarrow \left(-\frac{7}{24}\right)^2 + 1 = \frac{1}{\cos^2 \alpha} \Leftrightarrow$$

$$\Leftrightarrow \frac{119}{576} + 1 = \frac{1}{\cos^2 \alpha} \Leftrightarrow \frac{625}{576} = \frac{1}{\cos^2 \alpha} \Leftrightarrow$$

$$\Leftrightarrow \cos^2 \alpha = \frac{576}{625}, \quad \cos \alpha \in \left] \frac{\pi}{2}, \pi \right[, \quad \cos \alpha < 0$$

$$\Leftrightarrow \cos \alpha = -\sqrt{\frac{576}{625}} \Leftrightarrow \cos \alpha = -\frac{24}{25}$$

$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha} \Leftrightarrow \sin \alpha = \tan \alpha \cos \alpha$$

$$\Leftrightarrow \sin \alpha = \left(-\frac{7}{24}\right) \times \left(-\frac{24}{25}\right)$$

$$\Leftrightarrow \sin \alpha = \frac{7}{25}$$

Assim

$$A = -\frac{3}{2} \sin \alpha \cos \alpha = -\frac{3}{2} \left(\frac{7}{25}\right) \left(-\frac{24}{25}\right)$$

$$= \frac{252}{625}$$