

Fiche 5 - Intermediários 12° - 2008 - 2013

① $\sin u = \frac{\overline{BQ}}{4}$ $\cos u = \frac{\overline{PQ}}{4}$ $B = 2 + \overline{PQ} = 2 + 4 \cos u$
 $b = 2$

$\overline{BQ} = 4 \sin u$ $\overline{PQ} = 4 \cos u$ $h = \overline{BQ} = 4 \sin u$

$S(u) = \frac{B+b}{2} \times h = \frac{2+4 \cos u + 2}{2} \times 4 \sin u = \frac{4+4 \cos u}{2} \times 4 \sin u = (2+2 \cos u) \times 4 \sin u$
 $= 8 \sin u + 8 \sin u \cos u = 8 \sin u + 4 \times \frac{2 \sin u \cos u}{\sin(2u)} = 8 \sin u + 4 \sin(2u)$ e.g.d.

② $\sin u = \frac{\overline{PQ}}{2}$ $\cos u = \frac{\overline{BQ}}{2}$ $b = 2 + \overline{BQ} = 2 + 2 \cos u$
 $h = \overline{PQ} = 2 \sin u$

$\overline{PQ} = 2 \sin u$ $\overline{BQ} = 2 \cos u$

$A = \frac{b \times h}{2} = \frac{(2+2 \cos u) \times 2 \sin u}{2} = 2 \sin u + \frac{2 \sin u \cos u}{\sin(2u)} = 2 \sin u + \sin(2u)$ e.g.d.

③ $\sin u = \frac{OQ}{OP}$

$\sin u = \frac{1}{1+d} \Leftrightarrow 1+d = \frac{1}{\sin u} \Leftrightarrow d = \frac{1}{\sin u} - 1 \Leftrightarrow d = \frac{1 - \sin u}{\sin u}$ e.g.d.

④ a) $\tan u = \frac{\overline{BP}}{5}$

$\cos u = \frac{5}{AP}$

$\overline{AP}^2 = \overline{AB}^2 + \overline{BC}^2$

$\overline{AP}^2 = 25 + 25$

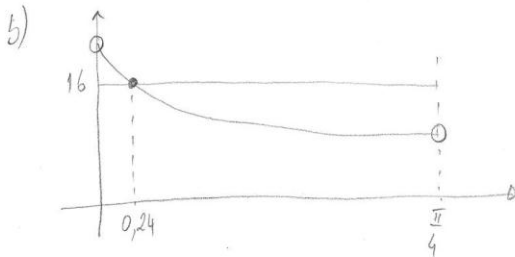
$\overline{AP} = \sqrt{50}$

$\overline{BP} = 5 \tan u$

$AP = \frac{5}{\cos u}$

$\overline{CP} = 5 - 5 \tan u$

Perímetro = $\frac{5}{\cos u} + 5 - 5 \tan u + \sqrt{50} = \frac{5}{\cos u} - 5 \tan u + \sqrt{50} + 5$ e.g.d.



R: $u = 0,24$

5.a) Para elevar a composição deve ter-se em conta que:

$$\left. \begin{aligned} d(0) &= \overline{OA} + \overline{AQ} = 1 + 3 = 4 \\ d(\pi) &= \overline{OA} + \overline{AQ} = 1 + 1 = 2. \text{ Logo } 2d(\pi) = 2 + 2 = 4 \end{aligned} \right\} \text{I é verdadeira}$$

se $u \in [0, \pi]$, $d \downarrow$
 se $u \in [\pi, 2\pi]$, $d \uparrow$ } II é falsa

5.b)

$$\cos u = \frac{\overline{OR}}{1}$$

$$\sin u = \frac{\overline{PR}}{1}$$

$$\boxed{\overline{OR} = \cos u}$$

$$\boxed{\overline{PR} = \sin u}$$

$$\overline{PR}^2 + \overline{RQ}^2 = 3^2$$

$$\sin^2 u + \overline{RQ}^2 = 9$$

$$\overline{RQ}^2 = 9 - \sin^2 u$$

$$\overline{RQ} = \sqrt{9 - \sin^2 u}$$

$$d(u) = \overline{OQ} = \overline{OR} + \overline{RQ} = \cos u + \sqrt{9 - \sin^2 u} \text{ qsd.}$$

$$6) A = \frac{b \times h}{2} = \frac{1 \times \sin\left(\frac{5\pi}{7}\right)}{2} \approx 0,39 \text{ (A)}$$