2ª Avaliação de Trigonometria - Nº 1

Q1: $\overset{\frown}{AP} = 8{,}5\,cm$ $\quad s = r.\theta \Rightarrow \theta = \frac{s}{r} \Rightarrow \theta = \frac{8{,}5}{1{,}5} \approx 5{,}67\,rad$

$r = 1{,}5\,cm$

$\theta \approx 5{,}67\,rad \approx 5{,}67 \cdot \frac{180°}{\pi} \approx \frac{5{,}67 \cdot 180°}{3{,}14} \approx 324{,}68°$

Q2: $\begin{cases} a+b = 75° \\ 2a+b = \frac{23\pi}{36}\,rad \end{cases}$ $\quad 75° = 75 \cdot \frac{\pi}{180} = \frac{5\pi}{12}\,rad$ ($\div 15$, $\div 15$)

$\begin{cases} a+b = \frac{5\pi}{12} \times (-1) \\ 2a+b = \frac{23\pi}{36} \end{cases} \Rightarrow \begin{cases} -a-\cancel{b} = -\frac{5\pi}{12} \\ 2a+\cancel{b} = \frac{23\pi}{36} \end{cases}$ $+$

$-\frac{5\pi}{12} + \frac{23\pi}{36} = \frac{-15\pi + 23\pi}{36} = \frac{8\pi}{36}$

$a = \frac{8\pi \div 4}{36 \div 4}$

$a = \frac{2\pi}{9}\,rad$

$a + b = \frac{5\pi}{12}$

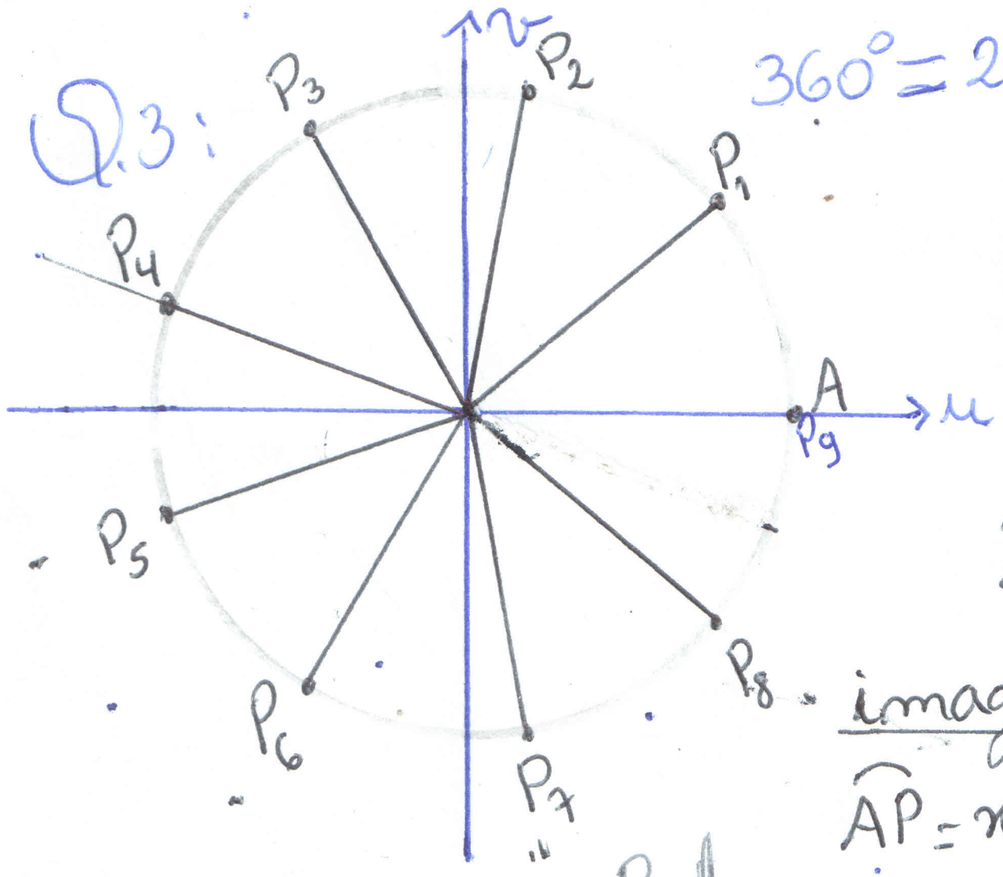
$\frac{2\pi}{9} + b = \frac{5\pi}{12}$

$b = \frac{5\pi}{12} - \frac{2\pi}{9}$

$b = \frac{15\pi - 8\pi}{36}$

$b = \frac{7\pi}{36}\,rad$

Q.3:



$360° = 2\pi\,rad$

$\frac{2\pi}{9}\,rad = 40°$

$\overset{\frown}{AP_1} = \frac{2\pi}{9}\,rad$ $\quad \overset{\frown}{AP_2} = \frac{4\pi}{9}\,rad$ $\quad \overset{\frown}{AP_3} = \frac{6\pi}{9} = \frac{2\pi}{3}\,rad$ ($\div 3$, $\div 3$)

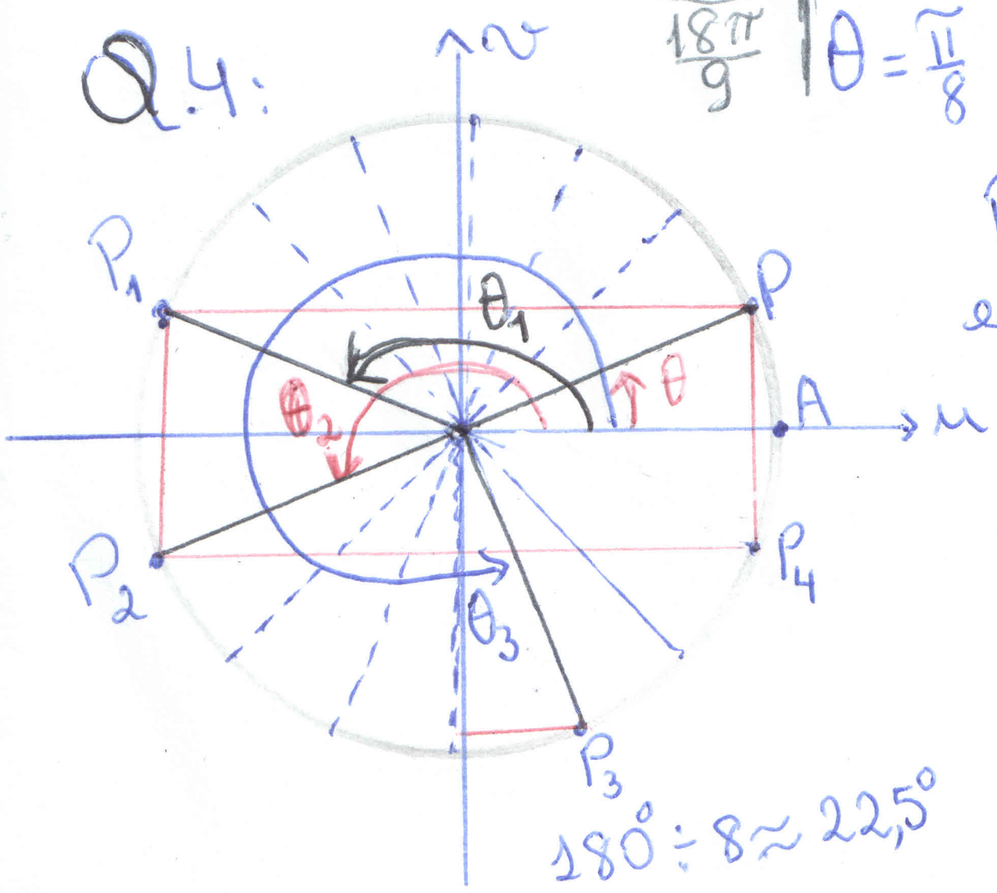
$\overset{\frown}{AP_4} = \frac{8\pi}{9}\,rad$ $\quad \overset{\frown}{AP_5} = \frac{10\pi}{9}\,rad$ $\quad \overset{\frown}{AP_6} = \frac{12\pi}{9} = \frac{4\pi}{3}\,rad$ ($\div 3$, $\div 3$)

$\overset{\frown}{AP_7} = \frac{14\pi}{9}\,rad$ $\quad \overset{\frown}{AP_8} = \frac{16\pi}{9}\,rad$

imagem de x	A	P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8
$\overset{\frown}{AP} = x\,rad$	0	$\frac{2\pi}{9}$	$\frac{4\pi}{9}$	$\frac{2\pi}{3}$	$\frac{8\pi}{9}$	$\frac{10\pi}{9}$	$\frac{4\pi}{3}$	$\frac{14\pi}{9}$	$\frac{16\pi}{9}$

P_9: $\frac{18\pi}{9}$

Q.4:



$180° \div 8 \approx 22{,}5°$

$\theta = \frac{\pi}{8}$; $\theta_1 = \frac{7\pi}{8}$; $\theta_2 = \frac{9\pi}{8}$ e $\theta_3 = \frac{13\pi}{8}$

P e P_1 são simétricos em relação ao eixo $\vec{v}$, então $\operatorname{sen}\frac{\pi}{8} = \operatorname{sen}\frac{7\pi}{8} \approx 0{,}3827$

P_1 e P_2 são simétricos em relação ao eixo $\vec{u}$, então $\operatorname{sen}\frac{7\pi}{8} = -\operatorname{sen}\frac{9\pi}{8} \Rightarrow \operatorname{sen}\frac{9\pi}{8} \approx -0{,}3827$

$\operatorname{sen}\frac{13\pi}{8} \approx -0{,}9239$

Q5: $f(x) = -|\cos(\frac{x}{2})| \Rightarrow f: \mathbb{R} \to [-1, 0]$

$D(f) = \mathbb{R}$; $Im(f) = [-1, 0]$

Tomando o intervalo $[a, b] = [-\pi, \pi]$ no domínio, temos:

$\Delta x = \underbrace{\pi}_{b} - \underbrace{(-\pi)}_{a} = \pi + \pi = 2\pi \Rightarrow$ período $= 2\pi$

A amplitude da imagem se manterá, porém as imagens positivas inverterão em relação ao eixo x. O gráfico será alongado em relação a x.

Q6: funções circulares de x: $\operatorname{cossec}(x) \approx -3{,}63$

$\operatorname{cossec}(x) = \frac{1}{sen(x)} \Rightarrow -3{,}63 = \frac{1}{sen(x)} \Rightarrow sen(x) = \frac{1}{-3{,}63}$

$\Rightarrow sen(x) \approx -0{,}275$

$sen^2(x) + \cos^2(x) = 1$

$(-0{,}275)^2 + \cos^2(x) = 1$

$\cos^2(x) = 1 - 0{,}075625$

$\cos(x) = \sqrt{0{,}924375}$

$\cos(x) \approx 0{,}961$

$tg(x) = \frac{sen(x)}{\cos(x)} = \frac{-0{,}275}{0{,}961} \approx -0{,}286$

$cotg(x) = \frac{\cos(x)}{sen(x)} = \frac{0{,}961}{-0{,}275} \approx -3{,}50$

$sec(x) = \frac{1}{\cos(x)} = \frac{1}{0{,}961} \approx 1{,}041$

Q7: $|\cos(x)| \leq 1$ $\quad \cos(x) = \frac{t-4}{3t}$

$\left|\frac{t-4}{3t}\right| \leq 1$

$-1 \leq \frac{t-4}{3t} \leq 1$

$-1 \leq \frac{t-4}{3t}$ e $\frac{t-4}{3t} \leq 1 \Rightarrow t - 4 \leq 3t$

$-1 \cdot 3t \leq t - 4$

$-3t \leq t - 4$

$4 \leq t + 3t$

$4 \leq 4t \Rightarrow \frac{4}{4} \leq t$

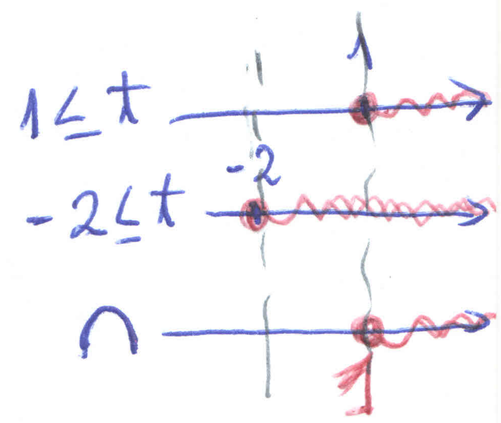
$1 \leq t$

$-4 \leq 3t - t$

$-4 \leq 2t$

$\frac{-4}{2} \leq t$

$-2 \leq t$



Assim, $1 \leq t$ ou $t \geq 1$.