7. EXERCÍCIOS

1) Mostre que:

a) $\cos^2 t = \dfrac{1}{1+\mathrm{tg}^2 t}$ b) $\mathrm{sen}^2 t = \dfrac{\mathrm{tg}^2\, t}{1+\mathrm{tg}^2 t}$.

2) Sabendo que $\mathrm{tg}\, t = 5$, $0^0 < t < 90^0$, calcule $\cos t$ e $\mathrm{sen}\, t$.

3) Considere um triângulo equilátero de lado 1, para calcular: sen 30^0, cos 30^0, tg 30^0, sen 60^0, cos 60^0 e tg 60^0.

4) Marque na circunferência trigonométrica as extremidades dos arcos de medidas dadas a seguir, onde $k \in Z$.

A) $x = 2k\pi \pm \dfrac{\pi}{4}$; B) $x = k\pi + \dfrac{5\pi}{6}$ C) $x = k\pi - \dfrac{\pi}{4}$

D) $x = \dfrac{2k\pi}{3}$ E) $x = \dfrac{2k\pi}{3} + \dfrac{\pi}{4}$ F) $x = \dfrac{k\pi}{2} + \dfrac{\pi}{6}$

5) Dados os conjuntos $E = \{ x \in R; x = k\pi/3 , k \in Z \}$, $F = \{x \in R; x = \pi/3 + k\pi/2, k \in Z\}$ e $G = \{ x \in R; x = 2k\pi/3, k \in Z \}$, determine e represente na circunferência trigonométrica:

A) $E \cap F$; B) $E \cap F \cap G$; C) $F - E$.

6) Diga se é verdadeiro ou falso:

A) $\mathrm{sen}\, 2 > 0$ B) $\cos 4 < 0$ C) $\mathrm{sen}\, 3 > \mathrm{sen}\, 2$ D) $\cos\pi/4 > \cos 1$ E) $\mathrm{tg}\, 5 > \mathrm{tg}\, 6$.

7) Sendo $\text{tg } t = \sqrt{\frac{a-b}{a+b}}$, $a > b > 0$ e $\cos t < 0$, calcule as demais funções trigonométricas de t.

8) Prove a identidade:

A) $\frac{1-\text{tg}^2 x}{1+\text{tg}^2 x} = 2\cos^2 x - 1$

9) Calcule:

A) $tg1935^\circ$ B) $\text{sen}\,3000^\circ$ C) $\text{tg}\frac{5\pi}{4}$ D) $\frac{\cos 765^\circ - \text{sen}\,1395^\circ}{tg1410^\circ}$

10) Determine o domínio e a imagem das seguintes funções:

A) f(x) = -2-cos x; B) f(x) = 1 + 4sen(x + π/3); C) f(x)=cotg(x - π/5).

11) Se f é uma função periódica de período T então a função g(t) = m + n f(at + b),a, b, m e n ∈ R e a e n são não nulos, é periódica com período $\frac{T}{|a|}$. Use este fato para determinar o período das seguintes funções:

A) f(t) = 3 - sen 4t; B) f(t) = 1 + 2cos (t/2); C) f(t) = tg (t + π).

12) Verifique a paridade das seguintes funções:

A) $f(t) = t^3 \cos t$; B) f(t) = t tgt;

13) Esboce o gráfico das funções definidas pelas seguintes sentenças, indicando domínio e imagem:

A) f(t) = 2 + cos t; B) f(t) = sen (t + π/4); C) f(t) = tg (t - π/4);

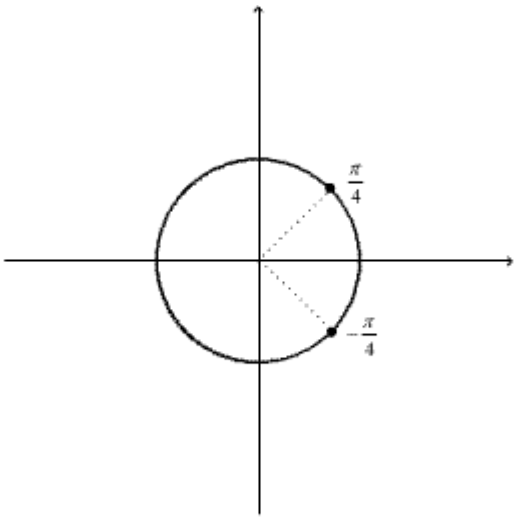
D) f(t) = sen (t/2); E) f(t) = -3cos t; F) f(t) = |sen t|;

G) f(t) = 1 + sen 2t.

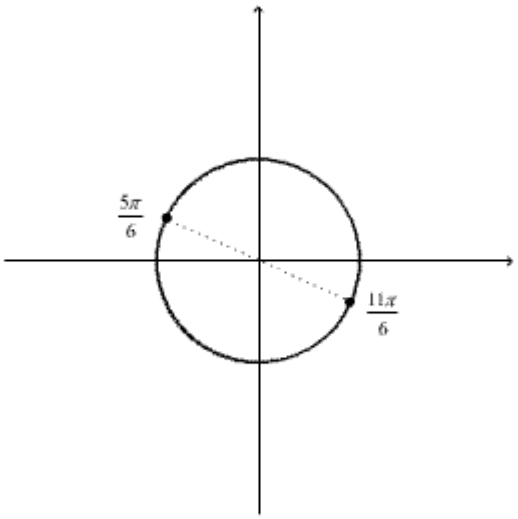
RESPOSTAS

2) $\cos t = \frac{1}{\sqrt{26}}$ e $\text{sen } t = \frac{5}{\sqrt{26}}$.

4A)



4B)



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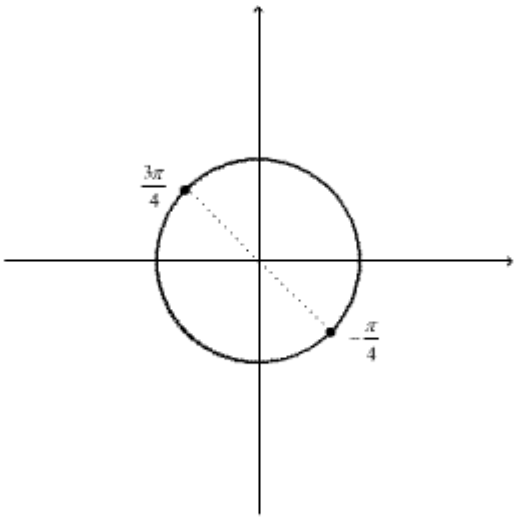

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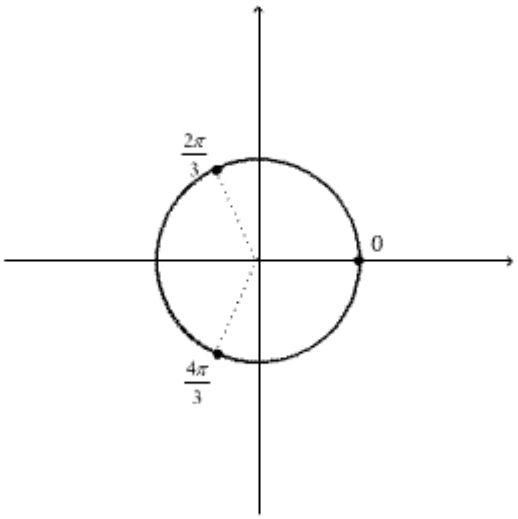

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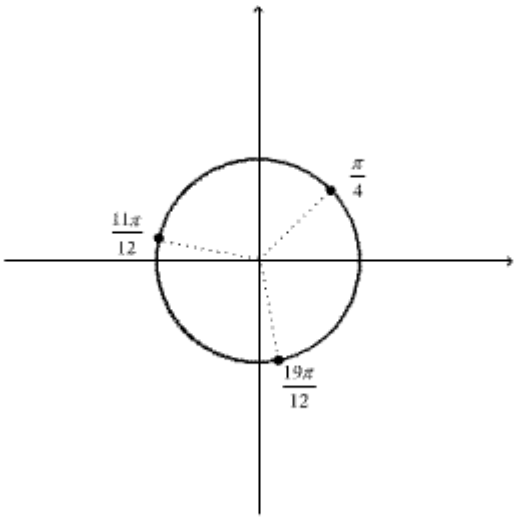
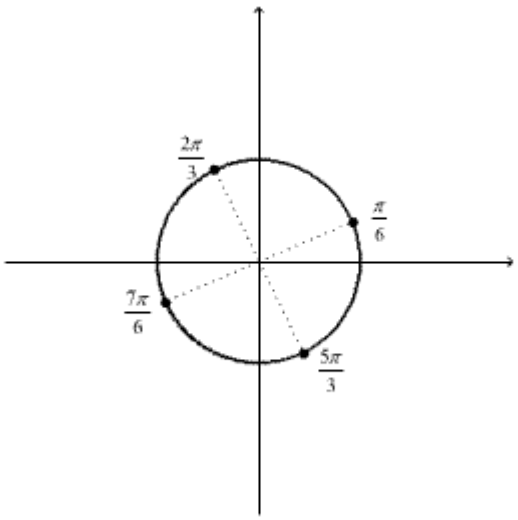
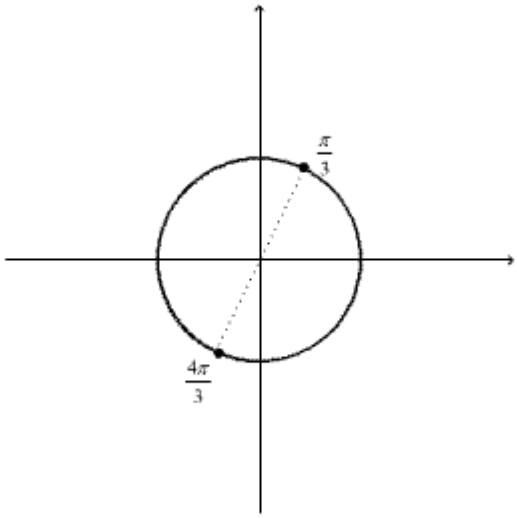


4G)



5A)

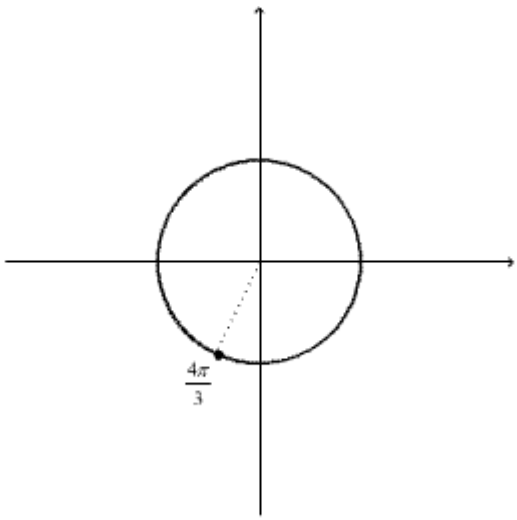
$$E \cap F = \left\{ x = k\pi + \frac{\pi}{3},\ k \in Z \right\}$$



5B)

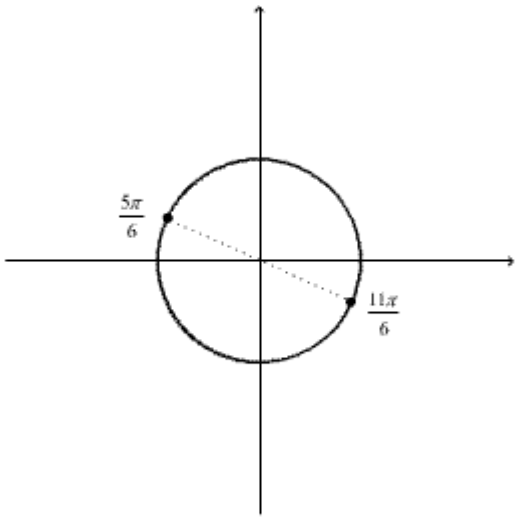
$$E \cap F \cap G =$$

$$\left\{ x \in R,\ x = \frac{4\pi}{3} + 2k\pi \ \text{ e } k \in Z \right\}$$



5C)

F - E = $\left\{ x \in R,\ x = \frac{5\pi}{6} + k\pi \quad e \quad k \in Z \right\}$



6) A) V B) V C) F D) V E) F

9) A) -1 B) $\sqrt{\frac{3}{2}}$ C) 1 D) 1 E) - $\sqrt{6}$

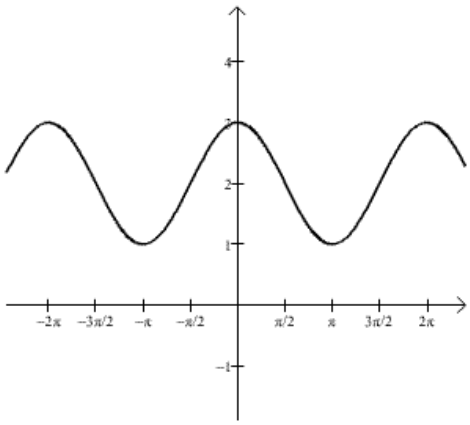
10) A) D = R e Im = [-3, -1] B) D = R e Im = [-3, 5]

C) D = $\left\{ x \in R; x \neq \frac{7\pi}{10} + k\pi \right\}$

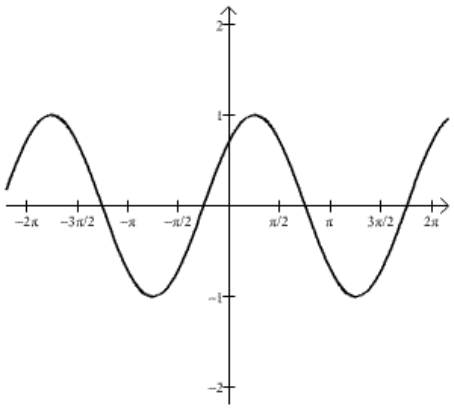
11) A) π/2 B) 4π C) π

12) A) ímpar B) par C) par

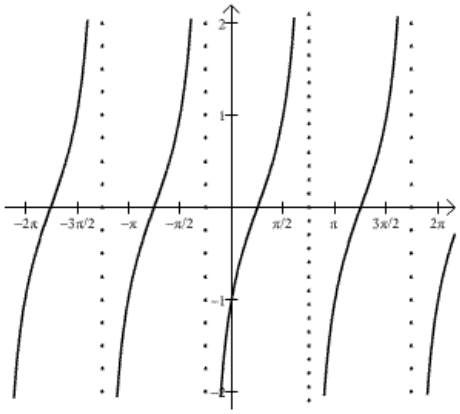
13A)



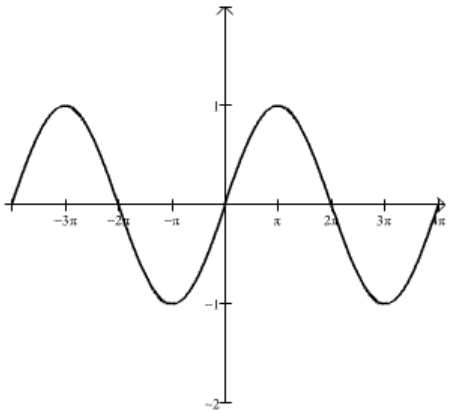
13B)



13C)



13D)



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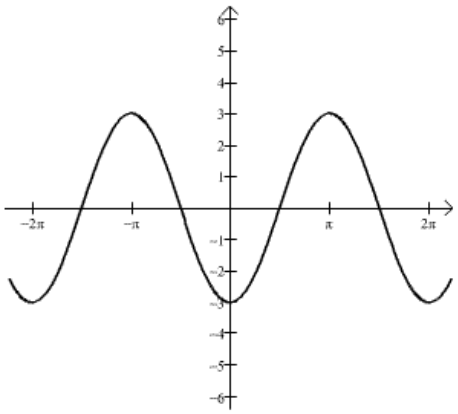
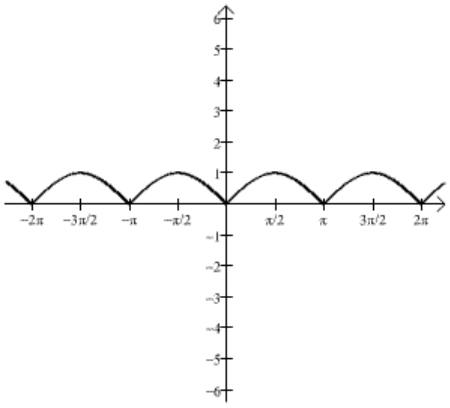


13F)



13G)