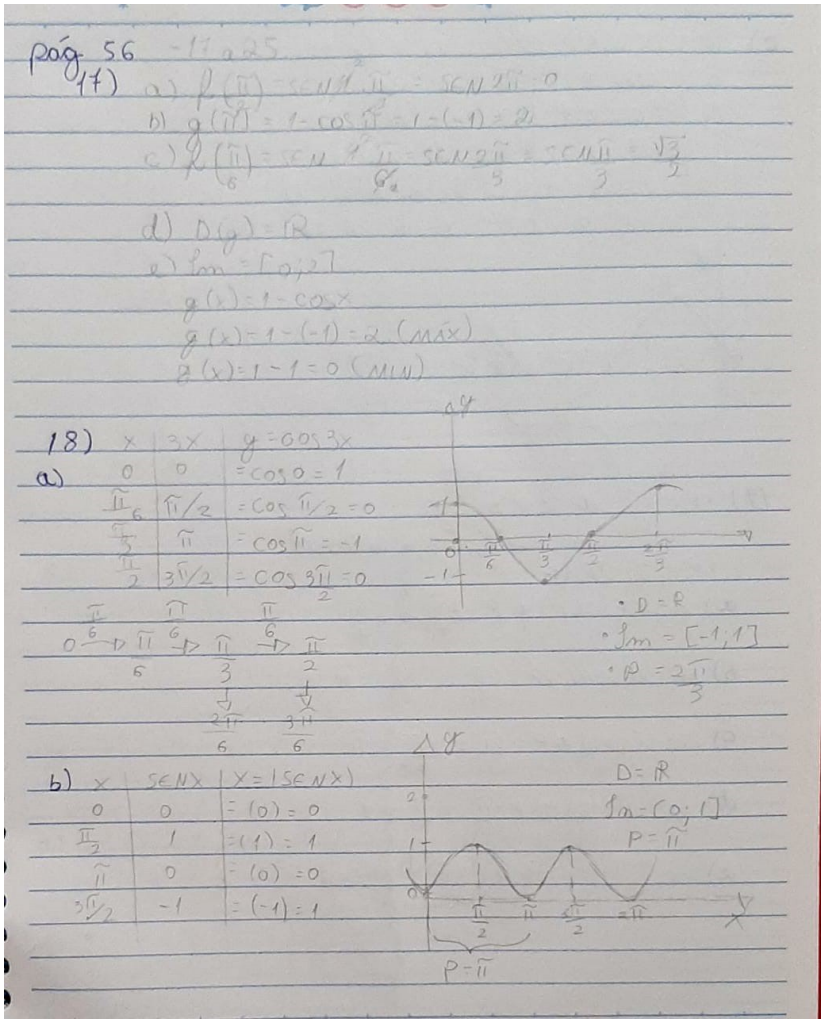
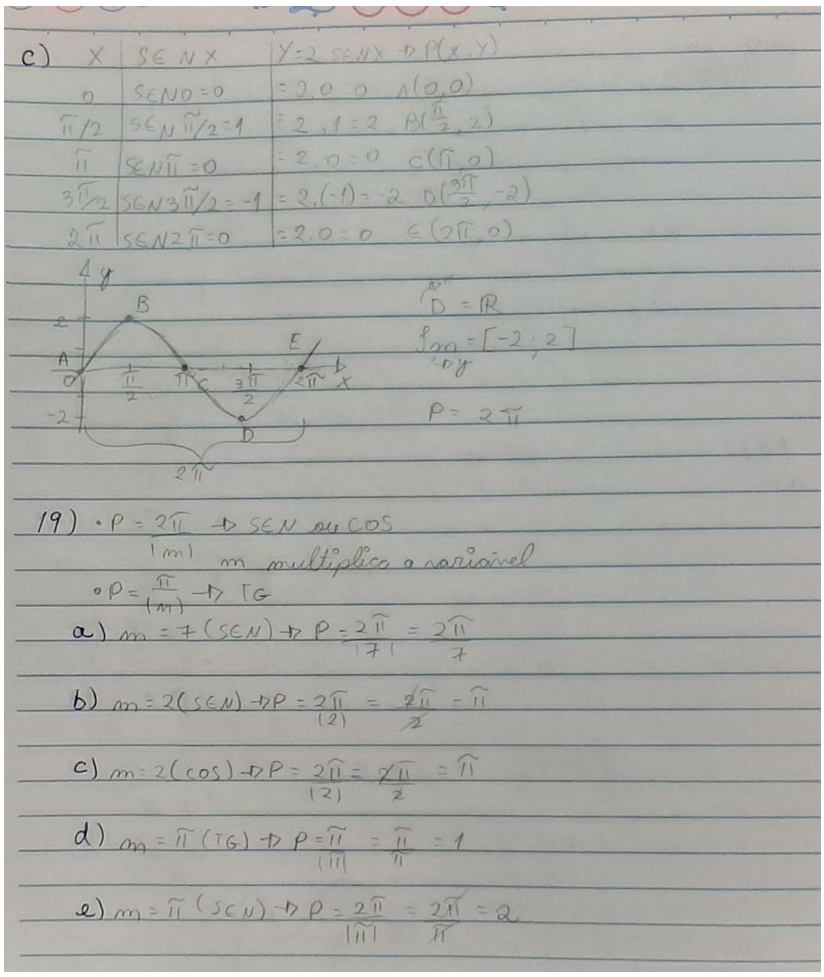
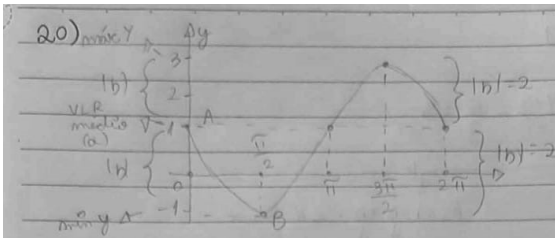
Nome: Giulia Ventura Favaro – 2 DS





20)



$P(x,y) \rightarrow F(x) = y$

$A(0;1)$	$B\left(\frac{\pi}{2};-1\right)$
$F(0) = 1$	$F\left(\frac{\pi}{2}\right) = -1$
$\alpha + b \cdot SEN\,0 = 1$	$\alpha + b \cdot SEN\frac{\pi}{2} = -1$
$\alpha + b \cdot 0 = 1$	$1 + b \cdot 1 = -1$
$\alpha + 0 = 1$	$b = -1 - 1$
$\alpha = 1$	$b = -2$

letra "D"

21) máx $y = 4$, mín $y = 2$, período 3

$P = \frac{2\pi}{|m|}$ $\left\{ \frac{2\pi}{|m|} = 3 \right.$

$\rightarrow |m| = \frac{2\pi}{3}$

$y = 3 + SEN\left[\left(\frac{2\pi}{3}\right) \cdot t\right]$

máx $SEN = 1$ MIN $SEN = -1$

a) $y = 2 \pm 2 \rightarrow Im = [0;4]$

b) $y = 2 \pm 2 \rightarrow Im = [0;4)$ -

c) $y = 3 \pm 1 \rightarrow Im = [2;4]$

d) $y = 3 \pm 1 \rightarrow Im = [2;4]$ -

e) $y = -3 \pm 2 \rightarrow Im = [-5;-1]$

$P = 3$ e $P = \frac{2\pi}{|m|}$

- $\frac{2\pi}{|m|} = 3 \rightarrow \frac{2\pi}{3} = |m| \rightarrow m = \frac{2\pi}{3}$
- máx $y = 4$, mín $y = 2$ $\Rightarrow Im = [2;4]$

b) $y = 2 + 2\,SEN\left(\frac{2\pi}{3} \cdot t\right)$

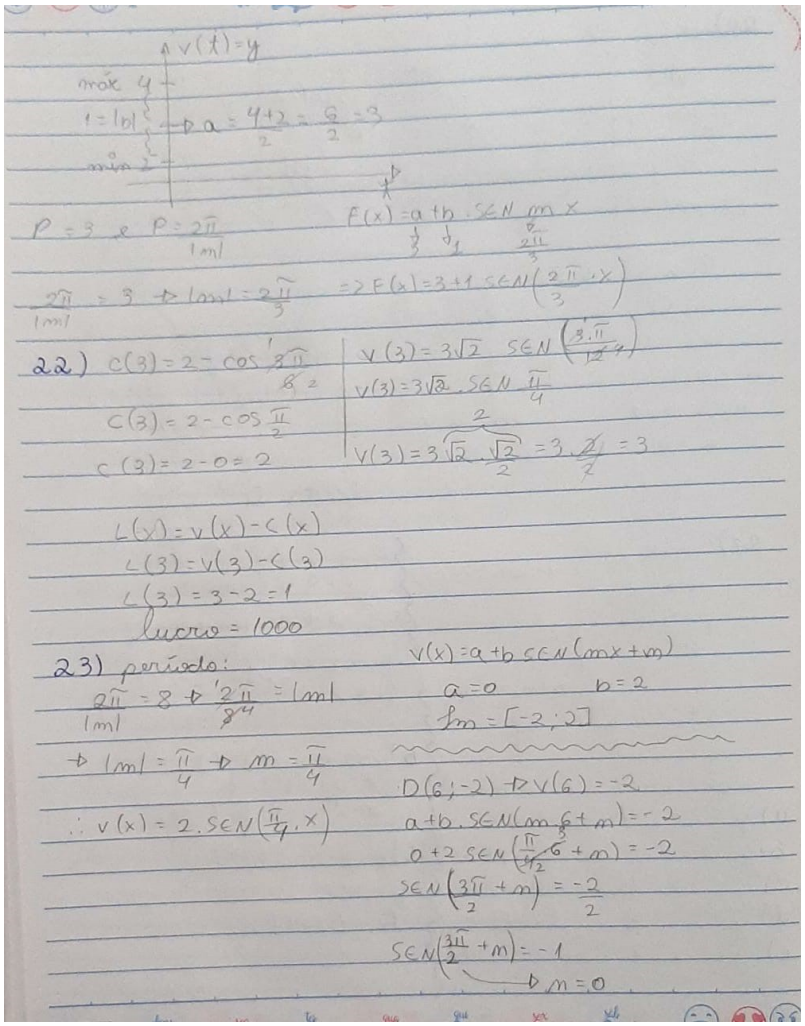
$y = 2 + 2 \cdot (\pm 1)$

$y = 2 \pm 2 \rightarrow Im\,[0;4]$

d) $y = 3 + SEN\left(\frac{2\pi}{3} \cdot t\right)$

$y = 3 \pm 1$

$Im = [2;4]$



22) $C(3) = 2 - \cos\frac{3\pi}{8}$ | $V(3) = 3\sqrt{2}\,SEN\left(\frac{3\cdot\pi}{12}\right)$

$C(3) = 2 - \cos\frac{\pi}{2}$ | $V(3) = 3\sqrt{2} \cdot SEN\frac{\pi}{4}$

$C(3) = 2 - 0 = 2$ | $V(3) = 3\sqrt{2} \cdot \frac{\sqrt{2}}{2} = 3 \cdot \frac{2}{2} = 3$

$L(x) = V(x) - C(x)$

$L(3) = V(3) - C(3)$

$L(3) = 3 - 2 = 1$

lucro = 1000

23) período: $\frac{2\pi}{|m|} = 8 \rightarrow \frac{2\pi}{8} = |m|$

$\rightarrow |m| = \frac{\pi}{4} \rightarrow m = \frac{\pi}{4}$

$\therefore v(x) = 2 \cdot SEN\left(\frac{\pi}{4} \cdot x\right)$

$v(x) = a + b\,SEN(mx + m)$

$a = 0$ $b = 2$

$Im = [-2;2]$

$D(6;-2) \rightarrow V(6) = -2$

$a + b \cdot SEN(m \cdot 6 + m) = -2$

$0 + 2\,SEN\left(\frac{\pi}{4} \cdot 6 + m\right) = -2$

$SEN\left(\frac{3\pi}{2} + m\right) = \frac{-2}{2}$

$SEN\left(\frac{3\pi}{2} + m\right) = -1$

$\rightarrow m = 0$

período: $P = \frac{2\pi}{|m|} \rightarrow \frac{2\pi}{|m|} = 8$

$\rightarrow \frac{2\pi}{8} = |m| \rightarrow m = \frac{\pi}{4}$

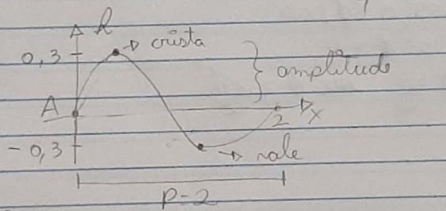
função: $v(x) = a + b \cdot \text{SEN}(mx + n)$ $m > 0$

$A(0;0) \rightarrow v(0) = 0$	$B(2,2) \rightarrow v(2) = 2$
$a + b \cdot \text{SEN}(m \cdot 0 + n) = 0$	$a + b \cdot \text{SEN}(m \cdot 2 + n) = 2$
$a + b \cdot \text{SEN}(m0 + 0) = 0$	$a + b \cdot \text{SEN}(\frac{\pi}{4} \cdot 2 + 0) = 2$
$a + b \cdot \text{SEN}\, 0 = 0$	$a + b \cdot \text{SEN}\, \frac{\pi}{2} = 2$
$a + b \cdot 0 = 0$	$a + b \cdot 1 = 2$
$a + 0 = 0$	$b = 2$
$a = 0$	

$v(x) = a + b \cdot \text{SEN}(mx + n) = 0 + 2\,\text{SEN}\left(\frac{\pi}{4} \cdot x + 0\right)$

$v(x) = 2\,\text{SEN}\,\frac{\pi}{4}x$

24)

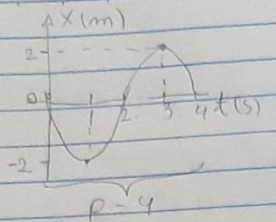


- $Im = [-0,3 ; 0,3] \rightarrow a = 0$
- Período: $P = \frac{2\pi}{|m|}$ $\quad 2 = \frac{2\pi}{|m|} \rightarrow |m| = \frac{2\pi}{2} \rightarrow m = \pi$

$h(x) = \underset{0}{a} + \underset{0,3}{b} \cdot \text{SEN}(\underset{\pi}{m}x + \underset{0}{n})$

$h(x) = 0,3\,\text{SEN}(\pi x)$

25)



$Im(F) = [-2,2] \rightarrow 0$

amplitude $= 2 \rightarrow |A| = 2 \rightarrow A = 2$

$x = A \cdot \cos(\omega t + \phi)$

$F(t) = A^2 \cdot \cos(\omega t + \phi)$

$\frac{\pi}{2}$

Período: $P = 4$	$0\,(0,0) \rightarrow F(0) = 0$
$\frac{2\pi}{\|\omega\|} = 4$	$A \cdot \cos(\omega t + \phi) = 0$
$\frac{2\pi}{4} = \|\omega\|$	$2\cos(\frac{\pi}{2} \cdot 0 + \phi) = 0$
$\omega = \frac{\pi}{2}$	$\cos(0 + \phi) = 0$
	$\cos\phi = 0$
	$\phi = \frac{\pi}{2}$ ou $\phi = \frac{3\pi}{2}$

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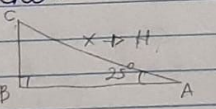
1) 1° trecho:

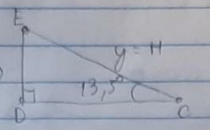


$\text{SEN} = \frac{\text{cos}}{H} \rightarrow \text{SEN}\,25° = \frac{\text{cos}\,25°}{H}$

$\rightarrow 0,423 = \frac{220}{X} \rightarrow X = \frac{220}{0,423}$

$X \simeq 520\ m$

2° trecho:



$396 - 220 = 176$

$\cos 13,5°$

$SEN\ 25° = \frac{CO\ 13,5°}{H}$

$0,233 = \frac{176}{Y} \rightarrow y = \frac{176}{0,233}$

$Y \cong 755\ m$

2) Lei Cossenos:

$\cos 120° = -\cos 60° = -\frac{1}{2}$

$x^2 = 89^2 + 20^2 - 2 \cdot 89 \cdot 20 \cdot \cos 120°$

$x^2 = 7921 + 400 - 2 \cdot 89 \cdot 20 \cdot \left(-\frac{1}{2}\right)$

$x^2 = 7921 + 400 + 1780 \rightarrow x = \sqrt{10101} \cong 100\ km$

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1) SENOIDE:

$\pi \cong 3,14 \rightarrow F(3,14) = 5$

$F(3\pi) \cong F(3 \cdot 3,14) = F(9,42)$

$F(3\pi) = F(\pi) = 5$ letra b

2) Imagem: $+1$ ou -1 (máx e mín)

$F(t) = \frac{\pi}{9} \cdot sen\left[\frac{2\pi}{3}\left(t - \frac{3}{4}\right)\right]$

máx SEN = 1	mín SEN = -1
$F(t) = \frac{\pi}{9} \cdot 1$	$F(t) = \frac{\pi}{9} \cdot (-1)$
$F(t) = \frac{\pi}{9}$ máx	$F(t) = -\frac{\pi}{9}$ mín

máx $\rightarrow F(t) = \frac{\pi}{9} \cdot \frac{180}{\pi\ Rad} = \frac{180}{9} = 20°$ letra c

3) $D = 60 \rightarrow R = 30$

lei cossenos:

$NNE^2 = NO^2 + NE^2 - 2 \cdot NO \cdot NE \cdot \cos\theta$

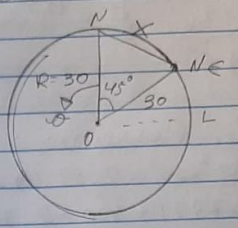
$x^2 = 30^2 + 30^2 - 2 \cdot 30 \cdot 30 \cdot \cos 45$

$x^2 = 900 + 900 - 2 \cdot 900 \cdot \frac{\sqrt{2}}{2}$

$x^2 = 1800 - 900 \cdot 1,4$

$x^2 = 1800 - 1260$

$x = \sqrt{540}$



4) $T(h) > 22$

$8 \cos\left[\left(\frac{h+9}{12}\right) \cdot \pi\right] > 22 - 18$

$\cos\left[\left(\frac{h+9}{12}\right) \cdot \pi\right] > \frac{4}{8} : 4 \rightarrow \frac{1}{2}$

$\cos\left[\left(\frac{h+9}{12}\right)\pi\right] > \frac{1}{2}$

$11 < H < 19$

intervalo de 8 hrs

$x \rightarrow$ ângulo

$\frac{5\pi}{3} < x < \frac{7\pi}{3}$

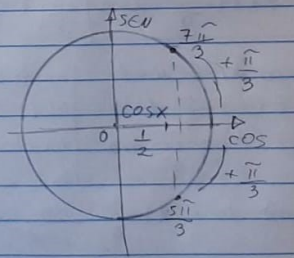
$\frac{5\pi}{3} < \left(\frac{h+9}{12}\right) \cdot \pi < \frac{7\pi}{3}$

$\frac{5\pi}{3} \cdot \frac{12}{\pi} < h + 9 < \frac{7\pi}{3} \cdot \frac{12}{\pi}$

$20 < h + 9 < 28$

$20 - 9 < h < 28 - 9$

$11 < h < 19$



$\cos x = \frac{1}{2} \rightarrow x = 60° = \frac{\pi}{3}$

5) máx radiação → I = 300 + 250 . 1

$SEN\left[\left(\frac{2\pi(d-77)}{365}\right)\right] = 1$ ($\pi/2$)

$\frac{2\pi(d-77)}{365} = \frac{\pi}{2}$

$\frac{2(d-77)}{365} = \frac{1}{2}$

$d - 77 = \frac{1 \cdot 365}{2 \cdot 2}$

→ $d - 77 = \frac{365}{4}$

$d - 77 = 91,25$

$d = 91,25 + 77$

$d = 168,25$

JAN → 31
FEV → 28
MAR → 31
ABR → 30
MAI → 31 → 151
JUN → 30 → 181
→ 168 → JUNHO

6) $F(x) = A + B . SEN(m.x)$ (ou COS)

máx = 70
A = 50
$|B| = 20$
min = 30
P = 24

$\frac{2\pi}{|m|} = 24$

$\frac{2\pi}{24} = |m|$ ($\frac{\pi}{12}$)

$\therefore m = \pi/12$

$F(t) = 50 + 20 \, SEN\left(\frac{\pi}{12} . t\right)$

7) lei dos cossenos:

$PB^2 = AB^2 + AP^2 - 2AB.AP.COS\theta$

$d^2 = 2,5^2 + 4,5^2 - 2.2,5.4,5.COS60$

$d^2 = 6,25 + 20,25 - 2.11,25.\frac{1}{2}$

$d^2 = 26,5 - 11,25$

$d = \sqrt{15,25} \cong 4$

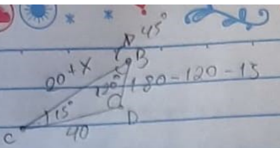
	MAX	m
PAB →	16	7
BP →	x	4

$7x = 16.4$

$x = \frac{64}{7} = 9,1$

$x = 9$ min. $0,1.60$ s (6 s)

8)



$* \; SEN\,120 = SEN\,60 = \frac{\sqrt{3}}{2}$

$\frac{BC}{SEN D} = \frac{CD}{SEN B}$

$\frac{20+x}{SEN120} = \frac{40}{SEN45}$

$\frac{20+x}{\frac{\sqrt{3}}{2}} = \frac{40}{\frac{\sqrt{2}}{2}}$

$(20+x)\sqrt{2} = 40.\sqrt{3}$

$20\sqrt{2} + \sqrt{2}x = 40\sqrt{3}$

$\sqrt{2}x = 40\sqrt{3} - 20\sqrt{2}$

$x = \frac{40\sqrt{3}}{\sqrt{2}} - \frac{20\sqrt{2}}{\sqrt{2}}$

$x = \frac{40\sqrt{3}}{\sqrt{2}} . \frac{\sqrt{2}}{\sqrt{2}} - 20$

$x = \frac{40\sqrt{6}}{2} - 20$

$x = 20\sqrt{6} - 20$

$x = 48 - 20 = 28$ m

9) lei cossenos

$AB^2 = AP^2 + BP^2 - 2\,AP.BP\,\cos\hat{P}$

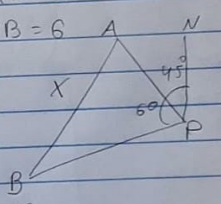
$x^2 = 16^2 + 6^2 - 2.16.6.COS60$

$x^2 = 256 + 36 - 2.96.\frac{1}{2}$

$x^2 = 292 - 96$

$x = \sqrt{196}$ → $x = 14$ km

AP = 16
PB = 6



10) $P = \frac{2\pi}{|m|} = \frac{2\pi}{\left|\frac{\pi}{6}\right|} = \frac{2\pi}{\frac{\pi}{6}} = 2\pi . \frac{6}{\pi} = 12$

$T(h) = 24 + 3.1 = 24 + 3 = 27$

$\cos\left(\frac{\pi t}{6} + \frac{\pi}{3}\right) = 1$ → $\frac{\pi t}{6} + \frac{\pi}{3.2} = \frac{2\pi}{1.6}$ → $\frac{\pi t}{6} + \frac{2\pi}{6} = \frac{12\pi}{6}$

0 ou 2π

$t = 12 - 2 = 10$

momento $= 5 + 10 = 15$ h