A_1) $\log_2\left(\log_5 2^{x^2}\right) - \log_2\left(\log_5 2\right) = 6 \rightarrow \log_2\left[\dfrac{x^2 \cdot \log_5 2}{\log_5 2}\right] = 6$

$\log_2 x^2 = 6 \implies x^2 = 2^6 \implies x^2 - 64 = 0 \implies (x+8)(x-8) = 0$

$\implies x_1 = -8 \, ; \, x_2 = 8 \implies \underline{x_1 + x_2 = 0}$ (D)

A_2)   P.A.: $9; 11; 13; \dots \quad a = 9; \, d = 2 \implies S_n = \dfrac{n}{2}\left[2a + (n-1)d\right] = \dfrac{n}{2}\left[18 + 2(n-1)\right]$ (•)

P.G.: $3; -6; 12; -24 \dots \quad a = 3; \, \gamma = -2 \implies S_9 = \dfrac{a(\gamma^n - 1)}{\gamma - 1} = \dfrac{3\left((-2)^9 - 1\right)}{(-2) - 1}$ (••)

(•) = (••) $\implies \dfrac{n}{2}\left[18 + 2(n-1)\right] = \dfrac{3(-512-1)}{-3} = 513$

$9n + n^2 - n = 513$

$n^2 + 8n - 513 = 0 \longrightarrow (n-19)(n+27) = 0$

$\qquad\qquad\qquad\qquad \hookrightarrow n = 19 \; \acute{o} \; n = 27$

(A)

A_3)   se busca $f(x) \le 0 \implies \dfrac{x^2 + x}{x^2 - 4} = \dfrac{x(x+1)}{(x+2)(x-2)} \implies$ Puntos críticos $\nearrow x = 0 \, ; \, x = -1$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \searrow x \ne -2 \, ; \, x \ne 2$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (\text{Indeterm.})$
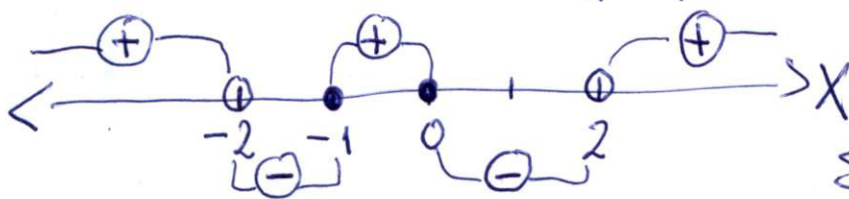
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ sol. $(-2; -1] \cup [0; 2)$ (D)

A_4) $I = (20 - x)(100 + 10x) = 2000 + 100x - 10x^2 = -10(x^2 - 10x) + 2000$

$\quad = -10(x^2 - 10x + 25 - 25) + 2000 = -10(x-5)^2 + 250 + 2000$

$\quad I = -10(x-5)^2 + 2250 \implies$ Precio $= 20 - 5 = 15$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Ingreso Máx. $= 2250$

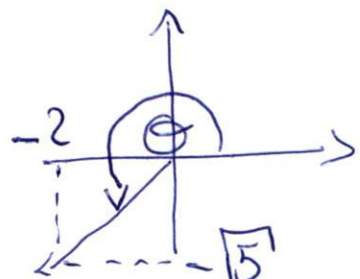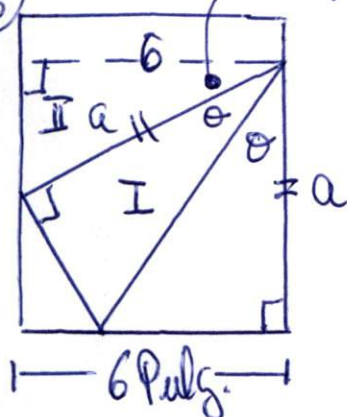**(6.5)** $\tan\theta = \dfrac{\sqrt{5}}{2}$ y $\cos\theta < 0 \Rightarrow \theta \in III\,c$

$\Rightarrow \cos\left(\dfrac{\theta}{2}\right) = \pm\sqrt{\dfrac{1+\cos\theta}{2}} = -\sqrt{\dfrac{1+\left(-\frac{2}{3}\right)}{2}} = -\dfrac{1}{\sqrt{6}}$ Ⓐ

$\dfrac{\theta}{2} \in II\,c$

$\gamma = \sqrt{4+5} = 3$

(6.6)

90° - 2θ

En ΔI: $\cos\theta = \dfrac{a}{L} \Rightarrow a = L\cos\theta$ ①

En ΔII: $\cos(90° - 2\theta) = \dfrac{6}{a} \Rightarrow a = \dfrac{6}{\underbrace{\cos(90°-2\theta)}_{\text{Sen}2\theta}}$ ②

De ① y ②: $L\cos\theta = \dfrac{6}{\text{Sen}2\theta}$

$\Rightarrow L = \dfrac{6}{\cos\theta \cdot 2\,\text{Sen}\theta\cos\theta} \Rightarrow L = \dfrac{3}{\text{Sen}\theta\,\cos^2\theta}$ Ⓓ

(6.7)

① ΔABC equilátero
② Se traza $\overline{OA}$; $\overline{OL}$ y $\overline{OC}$ ($\overline{OL}$ y $\overline{OC}$ son colineales) → Radio
③ $\overline{OL} \perp \overline{AB}$ (radio tangente)
④ $\overline{OA}$ bisectriz de $\hat{A}$
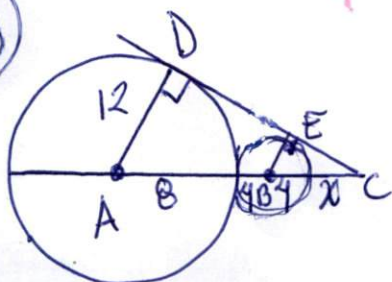⑤ ΔALO es especial 30° - 60° - 90°
⑥ $\overline{OA} = 2\gamma$ y $\overline{AM} = \sqrt{3}\gamma$ (Relaciones Métricas en ΔALO)
⑦ $\overline{AB} = L = 2\sqrt{3}\gamma \to$ ⑧ ΔAOC Isósceles $\Rightarrow \overline{OA} = \overline{OC} = 2\gamma$
⑨ $\overline{CM} = \gamma + 2\gamma = 3\gamma$ (altura) $\Rightarrow$ ⑩ $A_{ABC} = \dfrac{(2\sqrt{3}\gamma)(3\gamma)}{2}$

$A_{ABC} = 3\sqrt{3}\gamma^2$ Ⓐ

(6.8)

① $\overline{AD} \perp \overline{DC}$ y $\overline{BE} \perp \overline{CD}$ (radio tangente)
② $\hat{D} = \hat{E}$ y $\hat{C}$ común $\Rightarrow \Delta ADC \sim \Delta BEC$ (A.A)
③ $\dfrac{12}{4} = \dfrac{8+4+4+x}{4+x} \Rightarrow 3 = \dfrac{16+x}{4+x}$
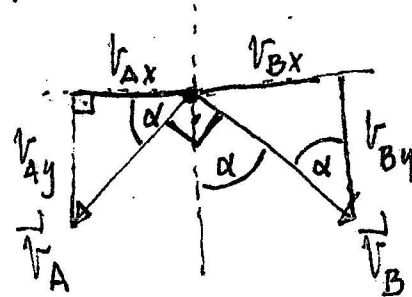
$\Rightarrow 12 + 3x = 16 + x \Rightarrow x = 2$ Ⓐ

Las magnitudes:

#9

$A \rightarrow x_A = 20t \rightarrow y_A = \dfrac{g}{2}t^2 \Rightarrow \begin{cases} V_{Ax} = 20 \\ V_{Ay} = gt \end{cases}$

$B \rightarrow x_B = 30t \rightarrow y_B = \dfrac{g}{2}t^2 \Rightarrow \begin{cases} V_{Bx} = 30 \\ V_{By} = gt \end{cases}$

$\tan \alpha = \dfrac{V_{Ay}}{V_{Ax}} = \dfrac{V_{Bx}}{V_{By}} \Rightarrow \dfrac{gt}{20} = \dfrac{30}{gt} \Rightarrow t = \sqrt{6} \Rightarrow d = x_A + x_B$

$\boxed{d = 50\sqrt{6} \,[m]}$ (d)

#10 $y = \overset{0}{320} + V_0(10) - \dfrac{g}{2}(10)^2 \rightarrow \boxed{V_0 = 18 \,[m/s]}$ (c)

#11

$y = \overset{0}{h} - \dfrac{g}{2}t^2$

$t = \dfrac{1}{5}\,[s]$

$\Rightarrow$ El hueco debe dar almenos una vuelta

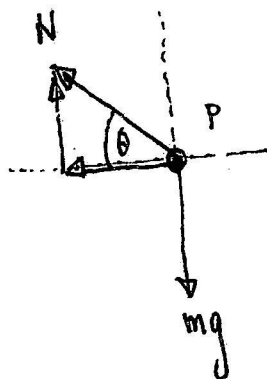$\theta = \overset{0}{\theta_0} + wt \Rightarrow \boxed{W = 10\pi \,\left[\dfrac{rad}{s}\right]}$ (a)
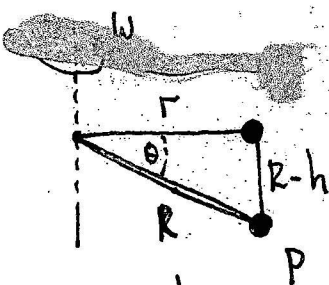
#12

$Sen\,\theta = \dfrac{R-h}{R}$

$Cos\,\theta = \dfrac{r}{R} \rightarrow r = R\,Cos\,\theta$

$N\,Sen\,\theta - mg = 0 \rightarrow N = \dfrac{mg}{Sen\,\theta}$

$N\,Cos\,\theta = mrw^2$

$\dfrac{mg}{Sen\,\theta}\,Cos\,\theta = mrw^2$

$\dfrac{g\,Cos\,\theta}{Sen\,\theta} = R\,Cos\,\theta\,w^2$

$\dfrac{g}{\frac{R-h}{R}} = Rw^2 \Rightarrow h = R - \dfrac{g}{w^2}$

$h = 1 - \dfrac{1}{10}$

$\boxed{h = 0,9\,[m]}$ (b)

Q13.- 1er a) $|C \equiv O|$ b) $|N \equiv O|$ c) $|\bar{S} = \bar{O}|$ d) $|\underline{O} = \underline{O}|$

(B)

Q.14 2.- $2 H_2(g) + O_2(g) \longrightarrow 2 H_2O(g)$

$\underset{4g}{\downarrow} \qquad \underset{32g}{\downarrow} \qquad\qquad \underset{36g}{\downarrow}$
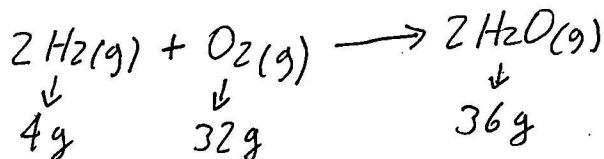
$10 g\ H_2 \ \dfrac{36 g\ H_2O}{4 g\ H_2} \cdot \dfrac{90\%\ R}{100\%\ R} = \overline{81 g\ H_2O}$ (A)

En exceso está el oxígeno!

Q15.- 3.- a) $1,3\ Kg\ C_3H_8 \cdot \dfrac{1000 g}{1 Kg} \cdot \dfrac{3\ at\text{-}g\ C}{44\ g\ C_3H_8} \cdot \dfrac{6,023 \cdot 10^{23}\ \acute{a}t.\ C}{1\ at\text{-}g\ C} =$

b) $5\ moles\ C_3H_8 \ \dfrac{3\ at\text{-}g\ C}{1\ mol\ C_3H_8} \cdot \dfrac{6,023 \cdot 10^{23}\ \acute{a}t.\ C}{1\ at\text{-}g\ C} =$

c) $25\ l\ C_3H_8 \ \dfrac{3\ \acute{a}t.\ g\ C}{22,4\ l\ C_3H_8} \cdot \dfrac{6,023 \cdot 10^{23}\ \acute{a}t.\ C}{1\ at\text{-}g\ C} = \overline{2,0166 \cdot 10^{24}\ \acute{a}tomos\ C}$ (C)

d) $800\ mmol\ C_3H_8 \ \dfrac{1\ mol}{1000\ mmol} \cdot \dfrac{3\ at\text{-}g\ C}{1\ mol\ C_3H_8} \cdot \dfrac{6,023 \cdot 10^{23}\ at\ C}{1\ at\text{-}g\ C} =$

Q.16 4.-
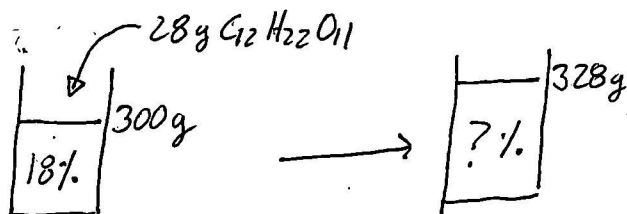
$m_{i\ C_{12}H_{22}O_{11}} = 300 \cdot 0,18 = 54 g$

$m_F \ \text{\tiny y} \ = 54 + 28 = 82 g$

$\%\ C_{12}H_{22}O_{11} = \dfrac{m_s}{m_{sol}} \cdot 100 = \dfrac{82}{328} \cdot 100 = \overline{25\ \%}$ (D)