SOLUCIÓN EXAMEN DE INGRESO 2DA OPCIÓN 26 DE JULIO DE 2018

A1. $50, 49, 48, \ldots$ es una sucesión aritmética con $d = -1$ y $a = 50$.

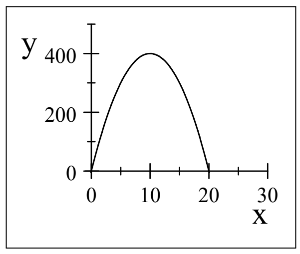
$$a_{40} = 50 + 39(-1) = 11 \text{ y } S_{40} = \frac{40(50+11)}{2} = 1220 \blacksquare \to (D)$$

A2. Del gráfico los ceros del polinomio son: $x = -1, x = 1, x = 2$

$\to\to$ Polinomio: $(x+1)(x-1)(x-2) = x^3 - 2x^2 - x + 2 \ \blacksquare \to (B)$

A3. $I(x) = 80x - 4x^2 = -4x^2 + 80x = -4(x^2 - 20x) = -4(x^2 - 20x + 100 - 100)$

$= -4(x-10)^2 + 400 \to\to x_m = 10; I_{\max} = 400$ Bs.$\to\to\to I_{\max} = 40x_m \blacksquare \to (C)$



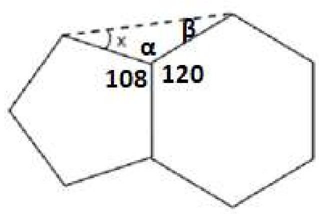
A4. $A(t) = Pe^{rt} \to 4000 = 1000e^{0.04t} \to 4 = e^{0.04t} \to 0.04t = \ln 4$

$\to\to \frac{4}{100}t = \ln 4 \to t = 25\ln 4 \blacksquare \to (B)$

G5. El ángulo interno de un polígono regular se calcula: $\widehat{i} = \frac{180(n-2)}{n}$

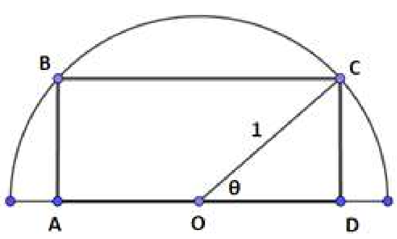
$\to\to \widehat{i}_{pentágono} = 108°; \ \widehat{i}_{hexagono} = 120° \to\to \alpha = 360 - 108 - 120 = 132$

y $\beta = x$ –por triángulo isósceles $\to\to\to 2x + 132 = 180 \to\to\to x = 24° \blacksquare \to (A)$



G6. $A = (AD)(DC) \to\to \sin\theta = \frac{CD}{1}$ y $\cos\theta = \frac{OD}{1}$ y $2(OD) = AD$

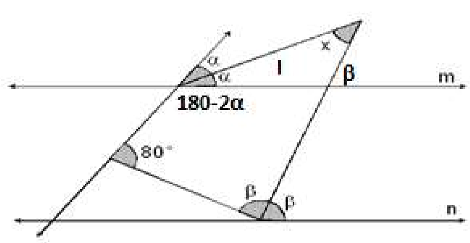
$\to\to A = 2(OD)(DC) = 2\sin\theta\cos\theta = \sin 2\theta \blacksquare \to (C)$



G7. Por ángulo externo en $\triangle I$: $\beta = \alpha + x$ y por suma de ángulos de un cuadrilátero:

$\beta + x + (\alpha + 180 - 2\alpha) + 80 = 360° \to\to \beta + x - \alpha = 100° \to\to \alpha + x + x - \alpha = 100°$

$\to\to 2x = 100° \to\to x = 50° \ \blacksquare \to (B)$



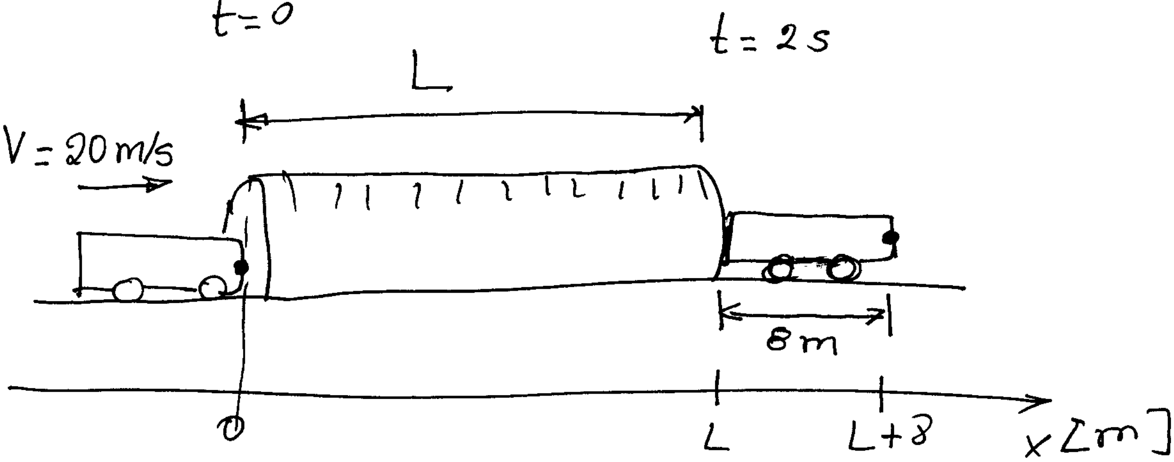
G8. $A = 90° - B \to\to$

$$Z = \frac{tan(A+2B) \cdot cos(2A+3B)}{\cot(2A+B) \cdot sen(4A+3B)} = \frac{tan(90° - B + 2B) \cdot cos(2(90° - B) + 3B)}{\cot(2(90° - B) + B) \cdot sen(4(90° - B) + 3B)}$$

$$= \frac{tan(90° + B) \cdot cos(180° + B)}{\cot(180° - B) \cdot sen(360° - B)} = \frac{(-\cot B) \cdot (-cosB)}{(-\cot B) \cdot (-senB)} = \cot B \blacksquare \to (A)$$

Física Fila 1

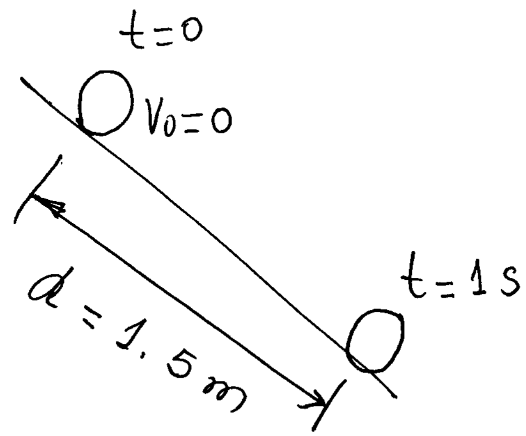
F9



$$V = \frac{L+8}{t} \Rightarrow L = Vt - 8$$

$$L = 20 \times 2 - 8 = \underline{32\ m}$$ C

F10



¿V después de 6s?

Como a = ctte $\Rightarrow$

$$d = \cancel{V_0 t}^{\,0} + \frac{1}{2}at^2$$

$$a = \frac{2d}{t^2}$$

$$a = \frac{2 \times 1.5}{1^2} = 3\ \frac{m}{s^2}$$

$$V = \cancel{V_0}^{\,0} + at$$

$$V = 3 \times 6$$

$$V = \underline{18\ \frac{m}{s}}$$ B

Física Fila 1

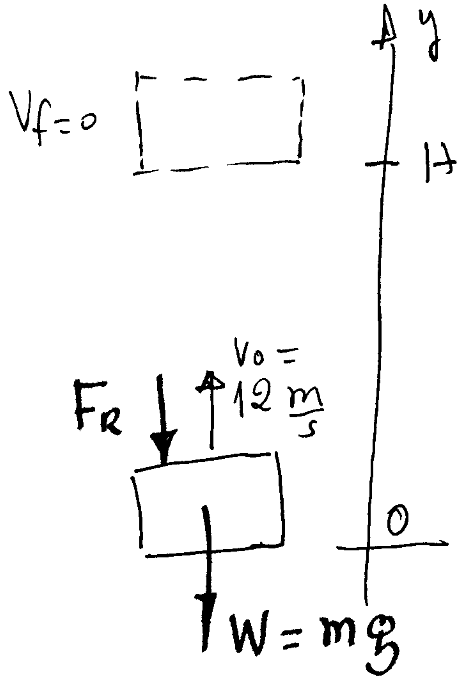
F11

$m = 2\ kg$

$V_0 = 12\ \frac{m}{s} \uparrow$

$F_R = 4\ N \downarrow$

$g = 10\ \frac{m}{s^2} \downarrow$



FR se opone al sentido del movimiento en éste probleme y en el F12

El peso es:

$W = 2 \times 10 = 20\ N \downarrow$

La fuerze neta es

$F_{neta} = F_R + W$

$F_{neta} = 20 + 4$

$F_{neta} = 24\ N \downarrow$

Por la 2da Ley de Newton

$F_{neta} = ma$

$\Rightarrow a = \frac{F_{neta}}{m} = \frac{24}{2}$

$a = 12\ \frac{m}{s^2} \downarrow$

Considerando hacia abajo negativo

$\cancel{V_f^2}^{\,0} = V_0^2 - 2aH \Rightarrow H = \frac{V_0^2}{2a}$

$H = \frac{12^{\cancel{2}}}{2 \times \cancel{12}} = \underline{6\ m}$ (B)

F12

$m = 3\ kg$

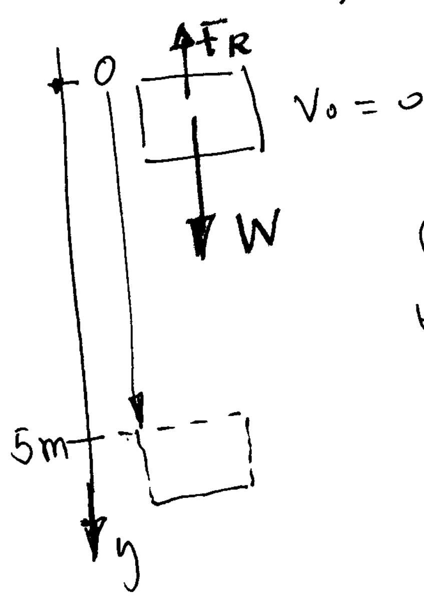
$V_0 = 0$

$F_R = 10\ N \uparrow$

W_{neto} ?

$h = 5\ m$

$\left(g = 10\ \frac{m}{s^2}\right)$



peso

$W = mg = 3 \times 10 = 30\ N \downarrow$

$F_{neta} = W - F_R = 20\ N \downarrow$

Como el desplazamiento es $5\ m \downarrow$

El trabajo neto es

$W_{neto} = F_{neta} \times 5$

$W_{neto} = 20 \times 5$

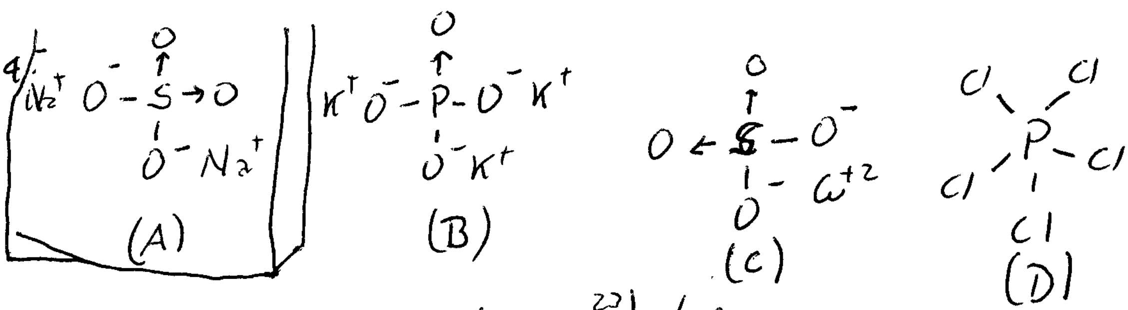
$W_{neto} = \underline{100\ [J]}$ (D)

Resolución

Q13.- $m_{H_2O} = m_{Et} = \rho_{H_2O} \cdot V_{H_2O} = 1\, \cancel{g/cm^3} \cdot 150\, \cancel{cm^3} = 150\,g$

$$\boxed{V_{Et} = \frac{m_{Et}}{\rho_{Et}} = \frac{150\,g}{0{,}8\,g/cm^3} = 187{,}5\,cm^3} \Rightarrow \text{C}$$

Q14.-



$\Rightarrow$ A

Q15.- A) $44{,}45\,g\,O_2 \cdot \dfrac{2(6{,}023 \cdot 10^{23})\,\text{át O}}{32\,g\,O_2} = 1{,}67 \cdot 10^{23}\,\text{at. O}$

B) $30{,}61\,\ell\,CO_2 \cdot \dfrac{2(6{,}023 \cdot 10^{23})\,\text{át O}}{22{,}4\,\ell\,CO_2} = 1{,}646 \cdot 10^{24}\,\text{át O}$

c) $1{,}55\,mol\,O_3\, \dfrac{3(6{,}023 \cdot 10^{23})\,\text{át O}}{1\,mol\,O_3} = 2{,}8 \cdot 10^{24}\,\text{át O}$

$$\boxed{\text{D)}\ 16{,}88\,g\,H_2SO_4 \cdot \frac{4\,(6{,}023 \cdot 10^{23})\,\text{át O}}{98\,g\,H_2SO_4} = 4{,}149 \cdot 10^{23}\,\text{át O}} \Rightarrow \text{D}$$

Q16.- $n_{He} = n_{H_2} = \dfrac{10\,g}{2\,g/mol} = 5\,mol \Rightarrow m_{He} = 5\,mol \cdot 4\,g/mol$

$$\boxed{m_{He} = 20\,g\,He} \Rightarrow \text{A}$$