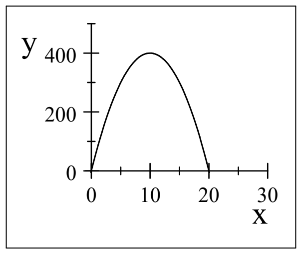
A1. $A(t) = Pe^{rt} \to 4000 = 1000e^{0.04t} \to 4 = e^{0.04t} \to 0.04t = \ln 4$
$\to\to \frac{4}{100}t = \ln 4 \to t = 25\ln 4$ ■ $\to (D)$

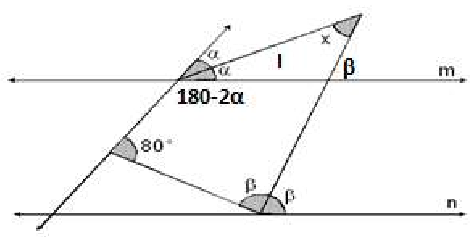
A2. $I(x) = 80x - 4x^2 = -4x^2 + 80x = -4(x^2 - 20x) = -4(x^2 - 20x + 100 - 100)$
$= -4(x-10)^2 + 400 \to\to x_m = 10; I_{\max} = 400$ Bs.$\to\to\to I_{\max} = 40x_m$ ■ $\to (A)$



A3. $50, 49, 48, \ldots$ es una sucesión aritmética con $d = -1$ y $a = 50$.
$a_{40} = 50 + 39(-1) = 11$ y $S_{40} = \frac{40(50+11)}{2} = 1220$ ■ $\to (A)$

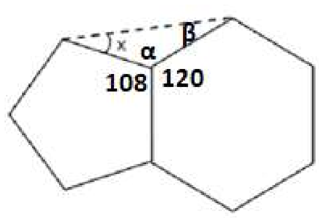
A4. Del gráfico los ceros del polinomio son: $x = -1, x = 1, x = 2$
$\to\to$ Polinomio: $(x+1)(x-1)(x-2) = x^3 - 2x^2 - x + 2$ ■ $\to (D)$

G5. Por ángulo externo en $\triangle I$: $\beta = \alpha + x$ y por suma de ángulos de un cuadrilátero:
$\beta + x + (\alpha + 180 - 2\alpha) + 80 = 360° \to\to \beta + x - \alpha = 100° \to\to \alpha + x + x - \alpha = 100°$
$\to\to 2x = 100° \to\to x = 50°$ ■ $\to (D)$

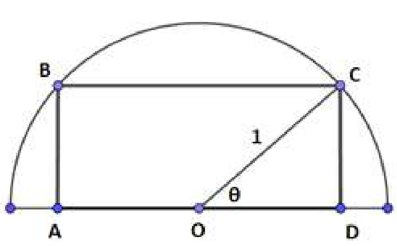


G6. $A = 90° - B \to$
$$Z = \frac{tan(A+2B) \cdot cos(2A+3B)}{\cot(2A+B) \cdot sen(4A+3B)} = \frac{tan(90° - B + 2B) \cdot cos(2(90° - B) + 3B)}{\cot(2(90° - B) + B) \cdot sen(4(90° - B) + 3B)}$$
$$= \frac{tan(90° + B) \cdot cos(180° + B)}{\cot(180° - B) \cdot sen(360° - B)} = \frac{(-\cot B) \cdot (-cosB)}{(-\cot B) \cdot (-senB)} = \cot B \text{ ■} \to (B)$$

G7. El ángulo interno de un polígono regular se calcula: $\hat{i} = \frac{180(n-2)}{n}$
$\to\to \hat{i}_{pentágono} = 108°; \hat{i}_{hexagono} = 120° \to\to \alpha = 360 - 108 - 120 = 132$
y $\beta = x$ –por triángulo isósceles $\to\to\to 2x + 132 = 180 \to\to\to x = 24°$■ $\to (D)$

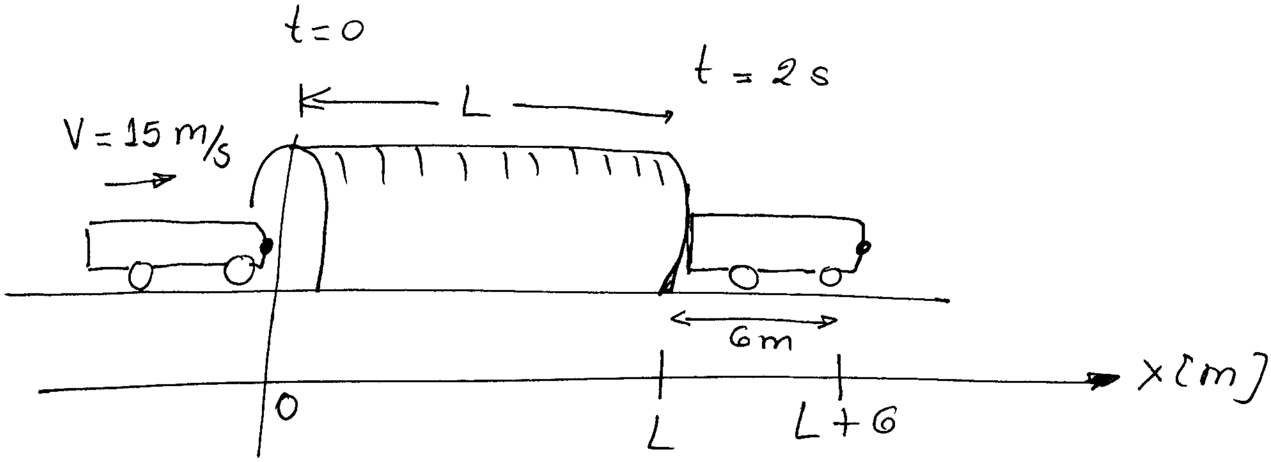


G8. $A = (AD)(DC) \to\to \sin\theta = \frac{CD}{1}$ y $\cos\theta = \frac{OD}{1}$ y $2(OD) = AD$
$\to\to A = 2(OD)(DC) = 2\sin\theta\cos\theta = \sin 2\theta$ ■ $\to (B)$



Física Fila 2

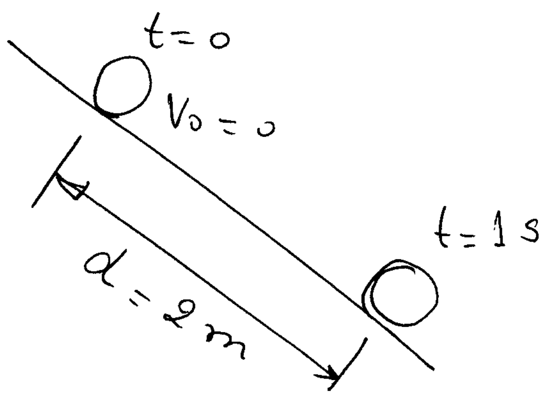
F9



$$V = \frac{L+6}{t} \Rightarrow L = Vt - 6$$

$$L = 15 \times 2 - 6 = \underline{24\ [m]}$$ C

F10



¿V después de 4 s?

Como $a = \text{ctte} \Rightarrow$

$$d = \cancel{V_0 t} + \frac{1}{2} a t^2$$

$$a = \frac{2d}{t^2} = \frac{2 \times 2}{1^2}$$

$$a = 4\ \frac{m}{s^2}$$

$$V = \cancel{V_0} + at$$

$$V = 4 \times 4$$

$$V = \underline{16\ \frac{m}{s}}$$ B

Física Fila 2

F11

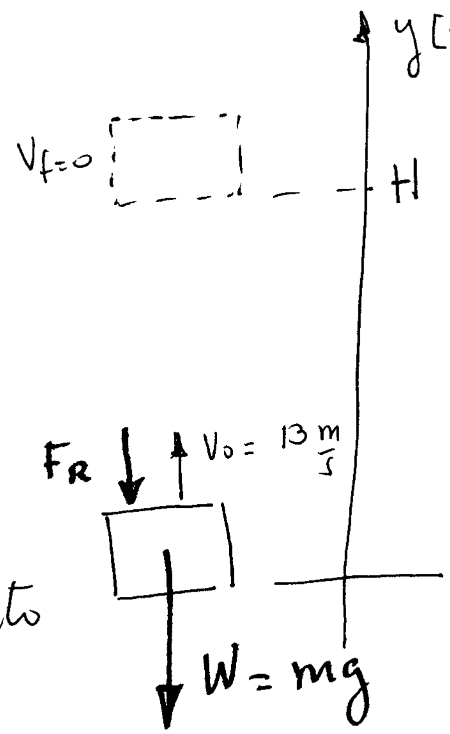
$m = 2\,kg$

$V_0 = 13\ \frac{m}{s}\ \uparrow$

$F_R = 6\ N \downarrow$

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

F_R se opone al sentido del movimiento en éste problema y en el F12



El peso es:

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

La fuerza neta es

$F_{neta} = F_R + W$

$F_{neta} = 20 + 6 = 26\ N.$

Por la 2da Ley de Newton

$F_{neta} = m a \Rightarrow$

$a = \frac{F_{neta}}{m} = \frac{26}{2}$

$a = 13\ \frac{m}{s^2} \downarrow$

Considerando hacia abajo negativo

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

$H = \frac{13^{\cancel{2}}}{2 \times \cancel{13}} = \underline{6.5\ m}$ //

C

F12

$m = 3\,kg$

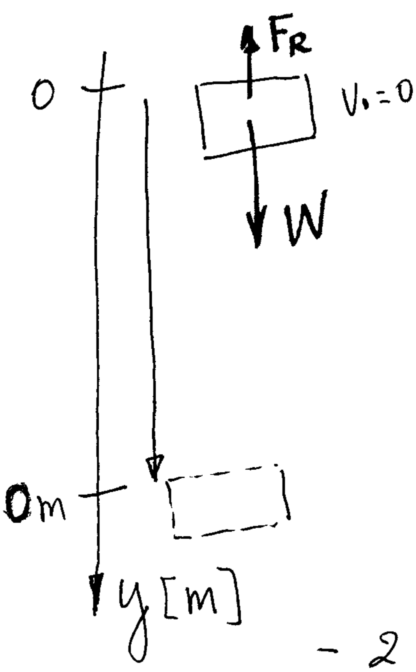
$V_0 = 0$

$F_R = 5\ N \uparrow$

W_{neto} ?

$h = 10\,m$

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



El peso es $W = 3 \times 10 = 30\ N \downarrow$

$F_{neta} = 30 - 5 = 25\ N \downarrow$

Como el desplazamiento es $10\ m \downarrow$

El trabajo neto es

$W_{neto} = F_{neta} \times 10$

$W_{neto} = 25 \times 10$

$W_{neto} = 250\ [J]$ //

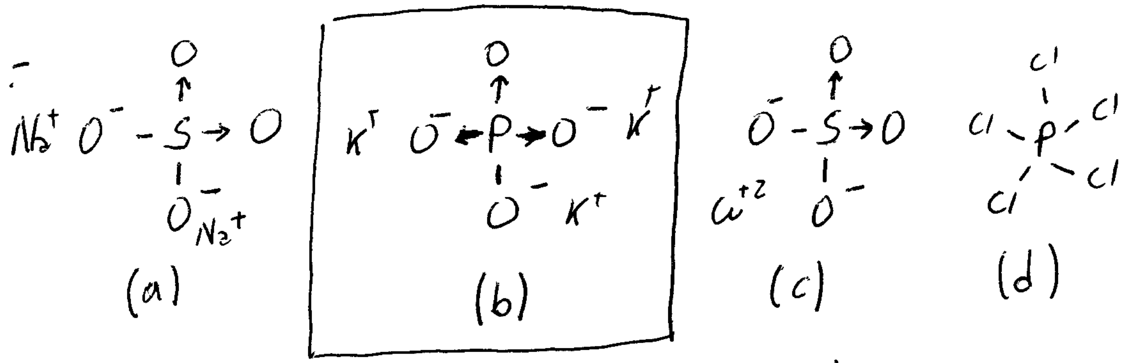
C

Resolución

Q13.- $m_{H_2O} = m_{Et} = \rho_{H_2O} \cdot V_{H_2O} = 1\ g/cm^3 \cdot 250\ cm^3 = 250\ g$

$$\boxed{V_{Et} = \frac{m_{Et}}{\rho_{Et}} = \frac{250\ g}{0,8\ g/cm^3} = 312,5\ g} \Rightarrow A$$

Q14.-



$\Rightarrow$ B

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

$\boxed{B)\ 30,61\ l\ CO_2 \cdot \frac{2(6,023 \cdot 10^{23})\ at\ O}{22,4\ l\ CO_2} = 1,646 \cdot 10^{24}\ at\ O} \Rightarrow$ B

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

D) $16,88\ g\ H_2SO_4 \cdot \frac{4(6,023 \cdot 10^{23})\ at\ O}{98\ g\ H_2SO_4} = 4,15 \cdot 10^{23}\ at\ O$

Q16.- $n_{H_2} = n_{He} = \frac{20\ g}{4\ g/mol} = 5\ moles \Rightarrow \boxed{m_{H_2} = 5\ mol \cdot 2\ g/mol = 10\ g\ H_2}$ D