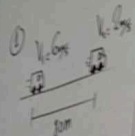


$$T_{\text{down}} = \frac{d}{v_1 - v_2}$$

$$= \frac{80 + 80}{6 - 2}$$

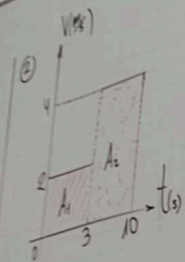
$$= \frac{160}{4}$$

$$= 40 \text{ s}$$

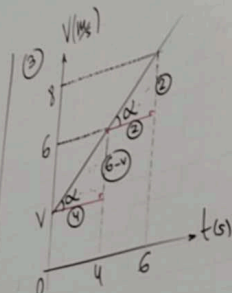


$$A_1 = 3 \times 2 = 6$$

$$A_2 = 7 \times 4 = 28$$



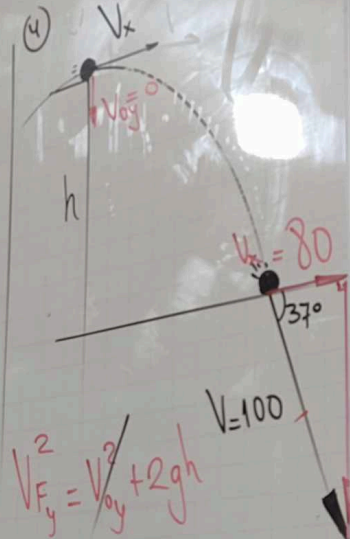
$$\tan \alpha = \frac{6 - v}{4} = \frac{2}{2}$$



$$6 - v = 4$$

$$v = 2 \text{ m/s}$$

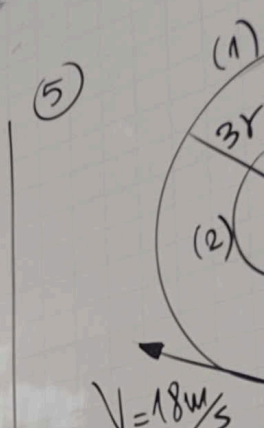
$$V_F^2 = V_{oy}^2 + 2gh$$

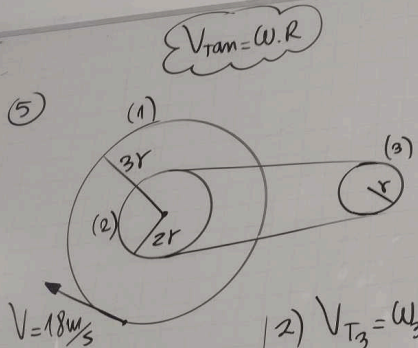


$$60^2 = 2(10)h$$

$$h = 180 \text{ m}$$

$$60 = V_{fy}$$



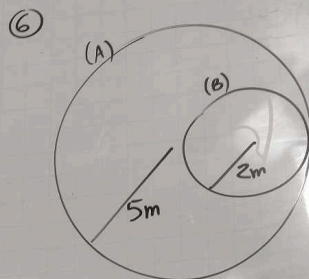


1) $\omega_1 = \omega_2$
 $\left(\frac{V_T}{R}\right)_1 = \left(\frac{V_T}{R}\right)_2$

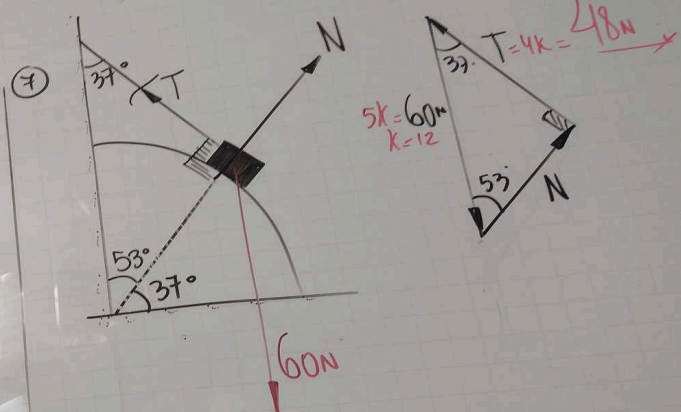
$\frac{18}{3r} = \frac{V_{T2}}{2r}$

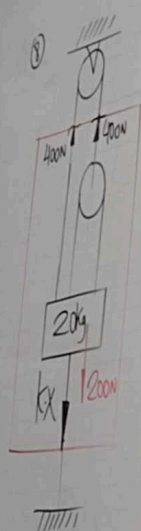
$V_{T2} = 12 \frac{m}{s} \therefore V_{T3} = 12 \frac{m}{s}$

2) $V_{T3} = \omega_3 \cdot R_3$
 $12 = \omega_3 (0.4)$
 $\omega_3 = 30 \frac{rad}{s}$



$V_{TA} = V_{TB}$
 $(\omega R)_A = (\omega R)_B$
 $4(5) = \omega_B (2)$
 $\omega_B = 10 \frac{rad}{s}$

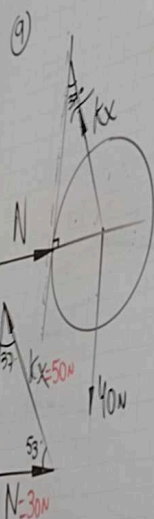




$$KX \cdot 200 = 800$$

$$KX = 600$$

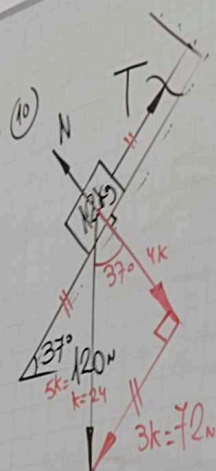
$$3000X = 600 \rightarrow X = 0.2m = 20cm$$



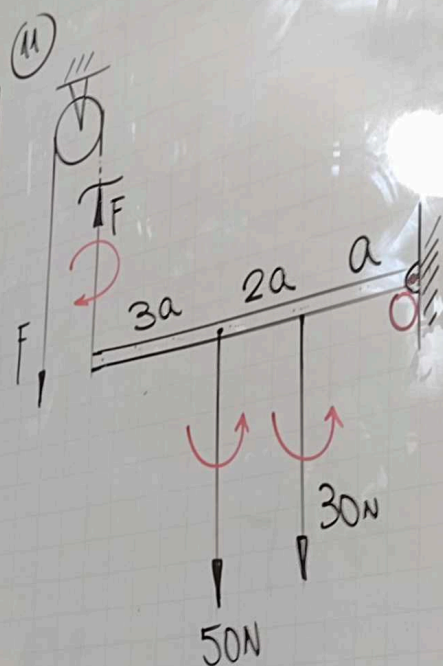
$$KX = 50$$

$$25X = 50$$

$$X = 2m$$



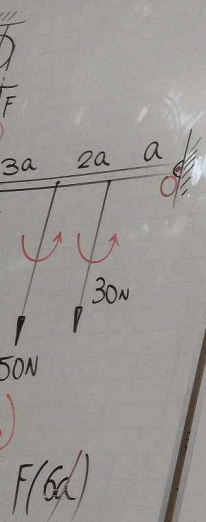
$$T = 72N$$



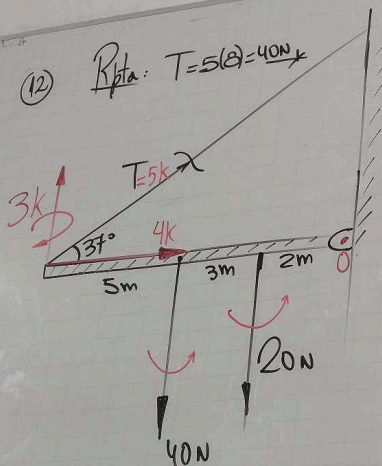
$$\sum M_o = \sum M_o$$

$$50(3a) + 30(a) = F(6a)$$

$$F = 30N$$



(12) Rpta: $T = 5(8) = 40N$

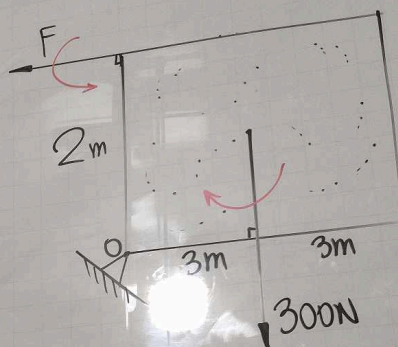


$$\sum M_o = \sum M_o$$

$$40(5) + 20(2) = 3K(10)$$

$$K = 8$$

(13)



$$\sum M_o = \sum M_o$$

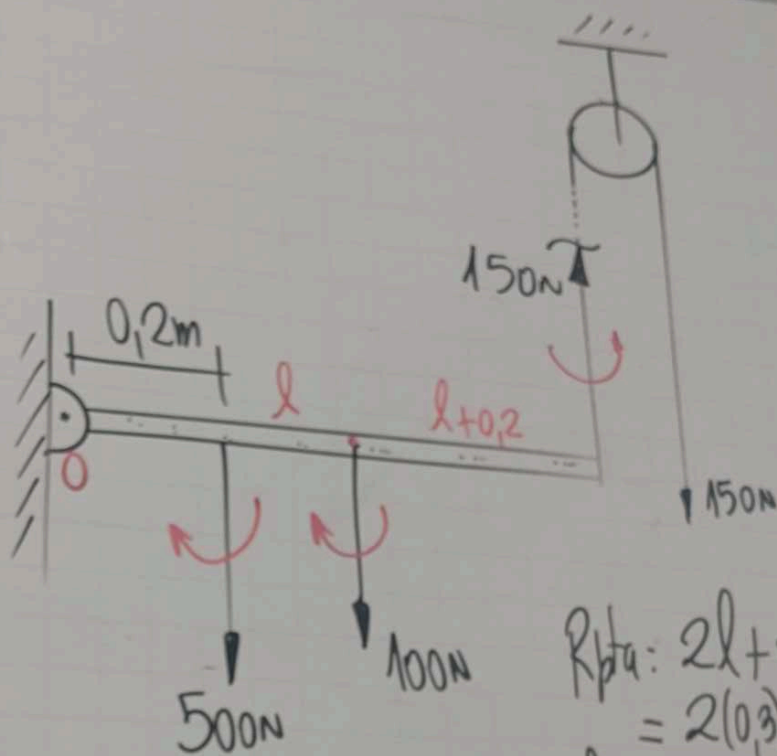
$$F(2) = 300(3)$$

$$F = 450N$$

(14)



(14)



$$R_{\text{pda}}: 2l + 0,4$$

$$= 2(0,3) + 0,4$$

$$l_{\text{BARRA}} = \frac{1\text{m}}{2}$$

$$\sum M_O = \sum M_O$$

$$150(2l + 0,4) = 500(0,2) + 100(l + 0,2)$$

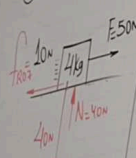
$$30l + 6 = 10 + 10l + 2$$

$$20l = 6$$

$$l = 0,3\text{m}$$

(16)

$$\mu = \frac{1}{4}$$



$$F_{\text{res}} = \mu N = \frac{1}{4} (40) = 10 \text{ N}$$

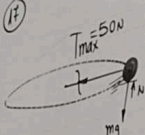
$$F_{\text{res}} = ma$$

$$50 - 10 = 4a$$

$$a = 10 \text{ m/s}^2$$

(17)

$$a_{\text{cp}} = \frac{v_{\text{max}}^2}{R} = \omega^2 R$$



$$F_{\text{cp}} = ma_{\text{cp}}$$

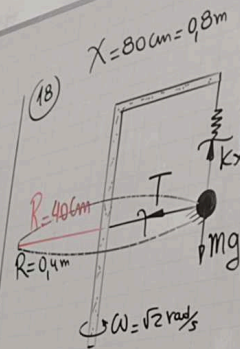
$$50 = \frac{1}{2} \left(\frac{v^2}{R} \right)$$

$$100 = \frac{v^2}{1}$$

$$v = 10 \text{ m/s}$$

$$v_{\text{max}}$$

(18)



$$1) \quad mg = kx$$

$$m(10) = \left(\frac{1000 \text{ N}}{\text{m}} \right) (0.8 \text{ m})$$

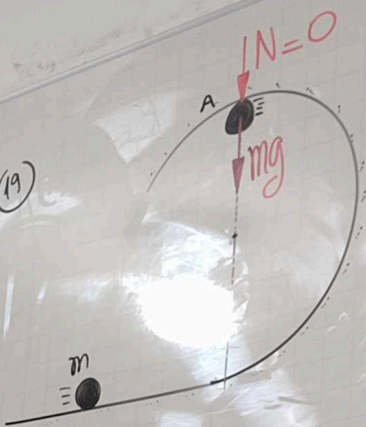
$$m = 80 \text{ kg}$$

$$2) \quad F_{\text{cp}} = ma_{\text{cp}}$$

$$T = 80(\omega^2 R)$$

$$T = 80(2/0.4) \rightarrow T = 64 \text{ N}$$

(19)



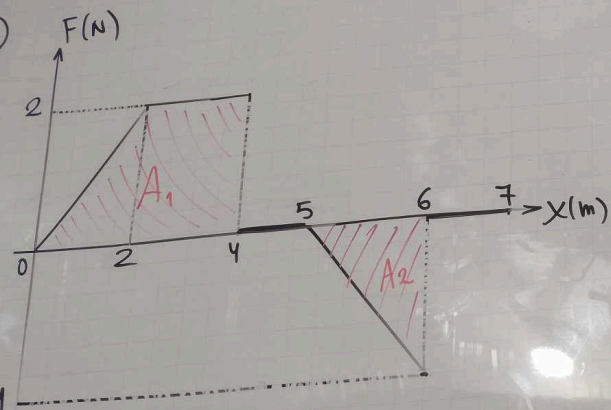
$$F_{\text{cp}} = ma_{\text{cp}}$$

$$mg = m \frac{v^2}{R}$$

$$10 = \frac{v^2}{1.6}$$

$$v = 4 \text{ m/s}$$

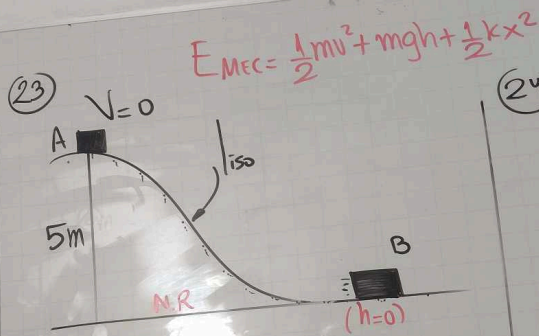
(22)



$$A_1 = \left(\frac{b+B}{2} \right) \cdot h = \left(\frac{4+2}{2} \right) \cdot 2 = 6$$

$$A_2 = \frac{b \times h}{2} = \frac{1 \times 1}{2} = 0.5$$

$$\therefore W_F = A_1 - A_2 = 5.5 \text{ J}$$

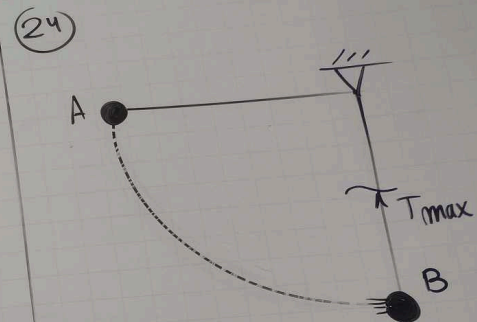


$$(E_{MEC})_A = (E_{MEC})_B$$

$$(mgh)_A = \left(\frac{1}{2}mv^2 \right)_B$$

$$10(5) = \frac{1}{2}V_B^2$$

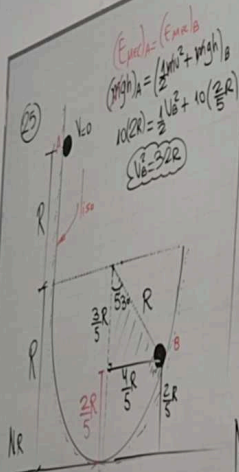
$$V_B = 10 \frac{\text{m}}{\text{s}}$$



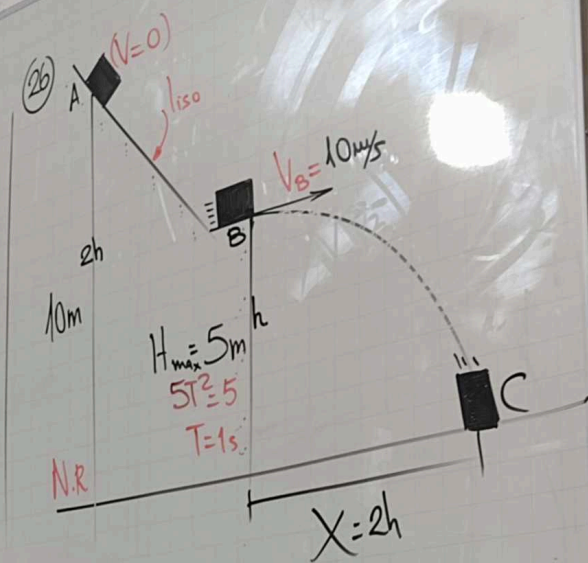
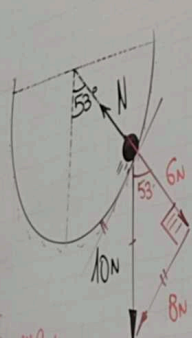
I) V

II) F

III) F

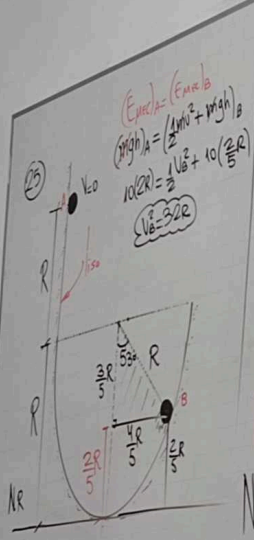


$m = 1 \text{ kg}$
 $(E_{\text{mec}})_A = (E_{\text{mec}})_B$
 $(mgh)_A = (mgh)_B + \frac{1}{2}mv_B^2$
 $10(2R) = \frac{1}{2}v_B^2 + 10(\frac{2R}{5})$
 $v_B = 32R$
 $F_{\text{ap}} = ma_{\text{cp}}$
 $N - G = m \left(\frac{v_B^2}{R} \right)$
 $N - G = \frac{32^2 R}{R}$
 $N = 38N$



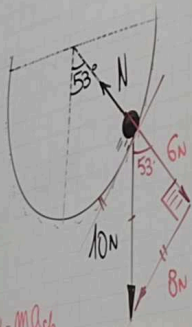
$(E_{\text{mec}})_A = (E_{\text{mec}})_B$
 $(mgh)_A = (mgh)_B + \frac{1}{2}mv_B^2$
 $10(10) = 10(5) + \frac{1}{2}v_B^2$
 $v_B = 10 \text{ m/s}$
 $d = v_x \cdot t$
 $X = 10(1)$
 $X = 10 \text{ m}$

Fusion =

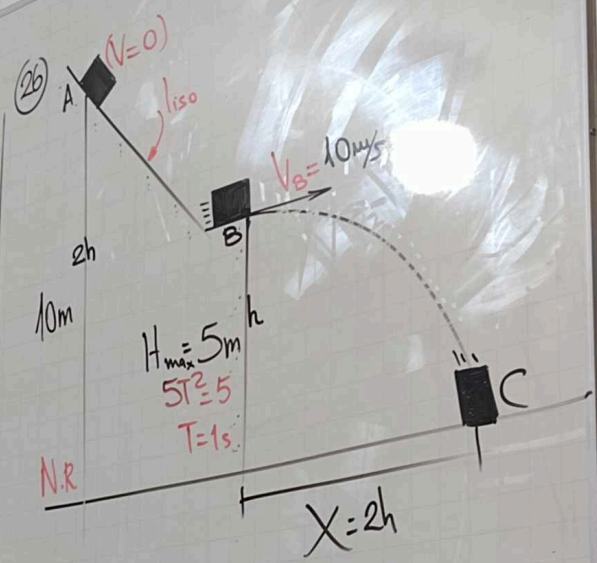


$(E_{mec})_A = (E_{mec})_B$
 $(mgh)_A = (mgh)_B + \frac{1}{2}mv_B^2$
 $10(2R) = \frac{1}{2}v_B^2 + 10(\frac{2R}{5})$
 $v_B = 32R$

$M = 1kg$



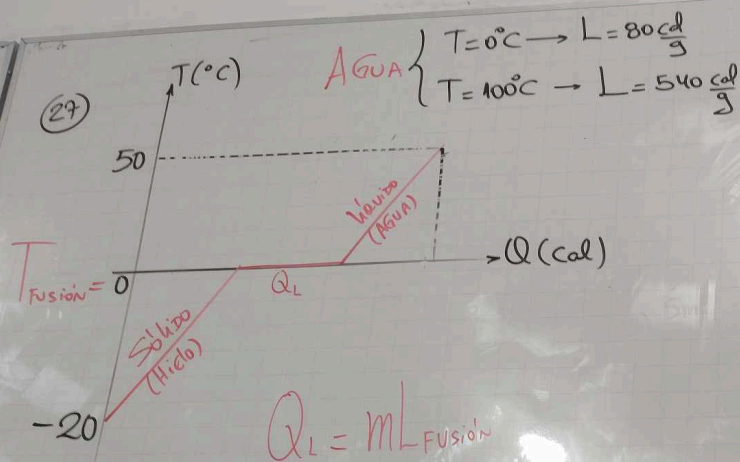
$F_{cp} = ma_{cp}$
 $N - 6 = 1 \left(\frac{v_B^2}{R} \right)$
 $N - 6 = \frac{32^2 R}{R}$
 $N = 38N$



$(E_{mec})_A = (E_{mec})_B$
 $(mgh)_A = (mgh)_B + \frac{1}{2}mv_B^2$
 $10(10) = 10(5) + \frac{1}{2}v_B^2$
 $v_B = 10m/s$

$d = v \times t$
 $X = 10(1)$
 $X = 10m$

Fusion



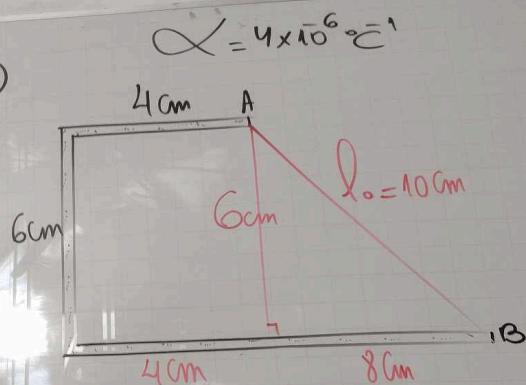
PUNTO TRIPLE DE AGUA:

$$T = 0,01^{\circ}\text{C}$$

$$P = 611,3 \text{ Pa}$$

$$\begin{aligned}
 Q_L &= m L_{\text{FUSIÓN}} \\
 &= 10(80) \\
 &= 800 \text{ cal} \\
 &= 0,8 \text{ kcal}
 \end{aligned}$$

(29)



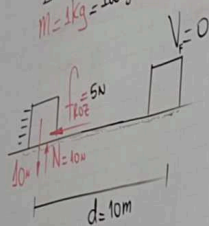
$$l_F = l_0(1 + \alpha \cdot \Delta T)$$

$$l_F = 10(1 + 4 \times 10^{-6} \times 100)$$

$$l_F = 10 + 4 \times 10^{-3}$$

$$l_F = 10 + 0,004 = 10,004 \text{ cm}$$

(28)
 $C_e = 0.01 \frac{\text{cal}}{\text{g}^\circ\text{C}}$
 $\Delta T = ?$
 $m = 1 \text{ kg} = 1000 \text{ g}$



$\checkmark f_{roz} = 1 \text{ N} = 0.5(10) = 5 \text{ N}$

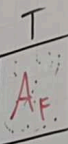
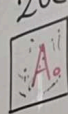
$\checkmark W_{roz} = -f_{roz} d = -5(10) = -50 \text{ J} \times \frac{0.24 \text{ cal}}{1 \text{ J}} = -12 \text{ cal}$

$\checkmark Q = -12 \text{ cal}$

$Q = m \cdot C_e \Delta T$
 $12 = 1000(0.01) \Delta T$
 $\Delta T = 1.2^\circ\text{C}$

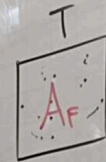
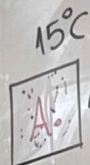
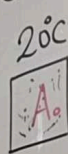
(31)

ACERO



ACERO

$\Delta L = 2\alpha_{ACERO}$



AL

AL

$\Delta A_{ACERO} = \Delta A_{AL}$

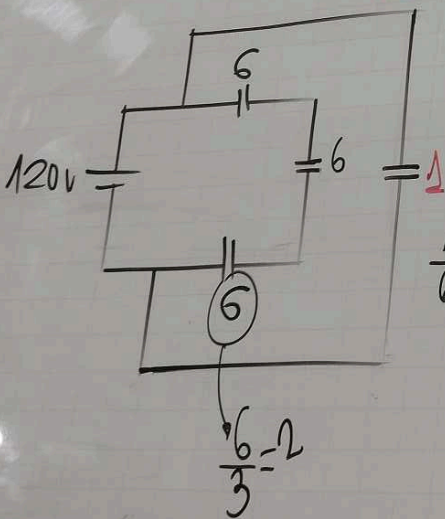
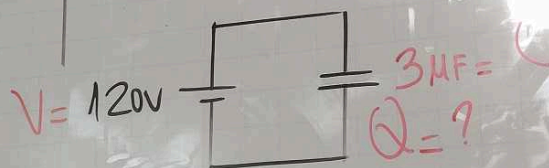
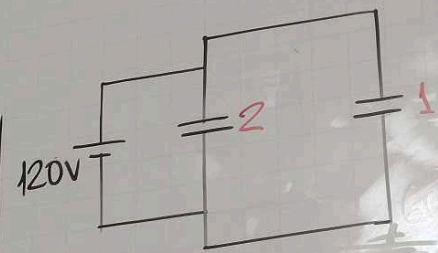
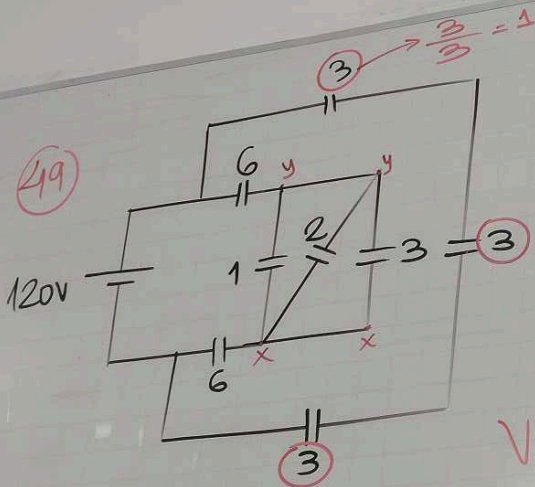
$(A_0 \cdot \beta \cdot \Delta T)_{ACERO} = (A_0 \cdot \beta \cdot \Delta T)_{AL}$

$2\alpha_{ACERO} \cdot (T - 20) = 2\alpha_{AL} \cdot (T - 15)$

$\alpha_{ACERO} (T - 20) = \alpha_{AL} (T - 15)$

$T - 20 = 2T - 30$

$T = 10^\circ\text{C}$



$$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{C}$$

$$\frac{1}{2} = \frac{1}{C}$$

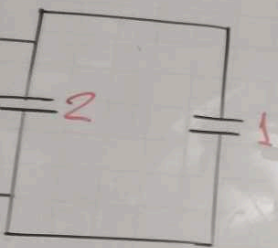
$$C = 2$$

$$Q = C \cdot V$$

$$Q = (3)(120)$$

$$Q = 360 \text{ MC}$$

(50)

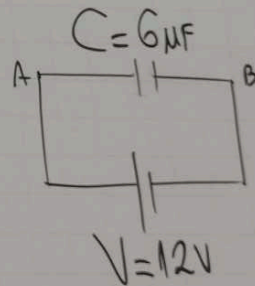
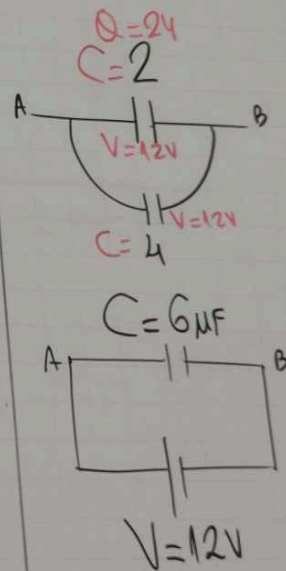
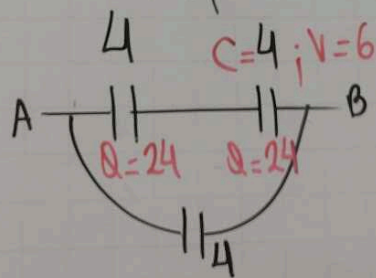
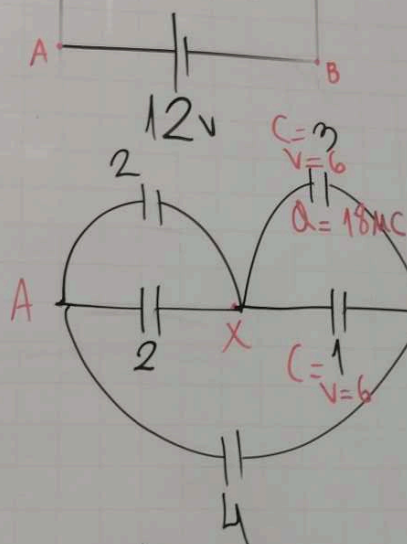
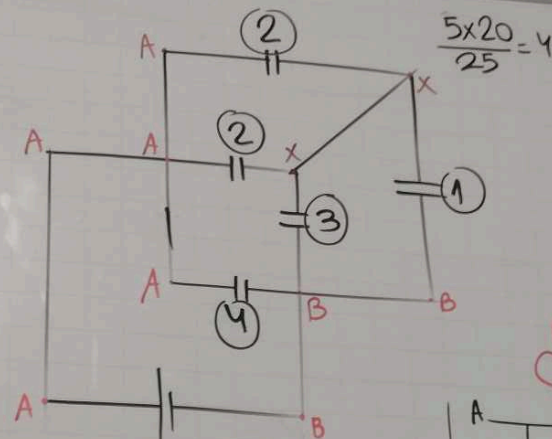


$3 \mu F = C$
 $Q = ?$

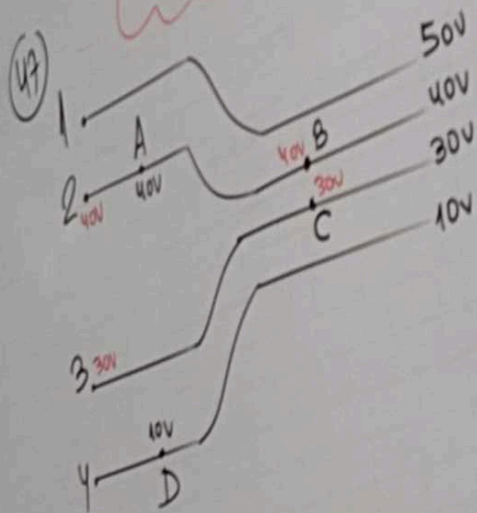
$C = V$
 $3)(120)$

$360 \mu C$

(50)



$$W_{A \rightarrow B} = q \cdot \Delta V$$



I) $W_{A \rightarrow D} = W_{B \rightarrow C}$ (F)

$30q_0$ $10q_0$

II) $W_{2 \rightarrow 3} = W_{A \rightarrow C}$ (V)

$10q_0$ $10q_0$

III) $W_{A \rightarrow B} = 0$ (V)