

# Solution Auxiliar 12

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P1

$$I = \left( \frac{n_2 - n_1}{n_2 + n_1} \right)^2 I_0$$

$I_0$  = intensidad luz incidente

$I$  = intensidad reflejada

$$I_{1R} = \left( \frac{1,5 - 1}{1,5 + 1} \right)^2 I_0 = \left( \frac{0,5}{2,5} \right)^2 I_0$$

$$\Rightarrow \boxed{I_{1R} = \frac{1}{25} I_0}$$

$$I_{1T} = I_0 - \frac{1}{25} I_0 \Rightarrow I_{1T} = \frac{24}{25} I_0$$

lo que se transmite  
después que la luz  
pasa la 1ª cara

$$I_{2R} = \left( \frac{1 - 1,5}{1 + 1,5} \right)^2 I_{1T} = \left( \frac{-0,5}{2,5} \right)^2 \cdot \frac{24}{25} I_0$$

$$I_{2R} = \frac{1}{25} \cdot \frac{24}{25} I_0 \Rightarrow I_{2R} = \frac{24}{625} I_0$$

$$I_{2T} = \frac{24}{25} I_0 - \frac{24}{625} I_0 \Rightarrow I_{2T} = \frac{576}{625} I_0$$

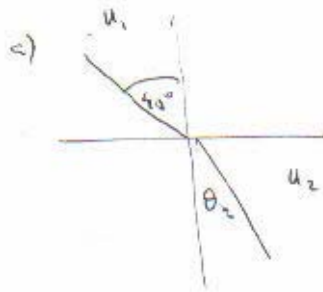
$$I_{2T} = 0,9216 I_0$$

$$I_{2T} = 92,16\% I_0$$



P2

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$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

para el azul:

$$1 \sin 45^\circ = 1,53 \sin \theta_2$$

$$\frac{1}{\sqrt{2}} \cdot \frac{1}{1,53} = \sin \theta_2$$

$$0,46 = \sin \theta_2$$

$$\boxed{27,5^\circ = \theta_{2A}}$$

Para el rojo

$$1 \sin 45^\circ = 1,5 \sin \theta_2$$

$$\frac{1}{\sqrt{2}} \cdot \frac{1}{1,5} = \sin \theta_2$$

$$0,47 = \sin \theta_2$$

$$\boxed{28,1^\circ = \theta_{2R}}$$

$$\boxed{\theta_{2R} - \theta_{2A} = 0,6^\circ}$$

b)  $1,5 \sin \theta_c = 1 \sin 90^\circ$

para el rojo

$$\sin \theta_c = \frac{1}{1,5}$$

$$0,66 = \sin \theta_c$$

$$\boxed{41,8^\circ = \theta_c}$$



para el azul

$$1,53 \sin \theta_c = 1 \sin 90^\circ$$

$$\sin \theta_c = \frac{1}{1,53}$$

$$\sin \theta_c = 0,65$$

$$\boxed{\theta_c = 40,8^\circ}$$

P3

$$\frac{1}{s} + \frac{1}{s'} = \frac{2}{R}$$

$$\frac{1}{10} + \frac{1}{s'} = -\frac{2}{10}$$

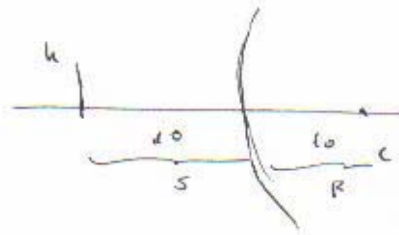
$$\frac{s' + 10}{10s'} = -\frac{2}{10}$$

$$\boxed{-\frac{10}{3} = s'}$$

$$\frac{h'}{h} = -\frac{s'}{s}$$

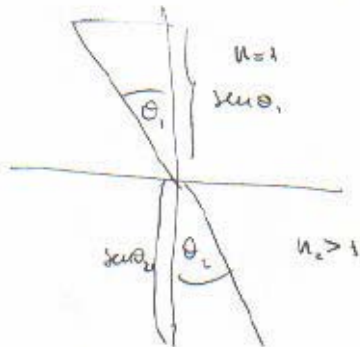
$$\Rightarrow \frac{h'}{2} = \frac{10}{3} \cdot \frac{1}{10}$$

$$\boxed{h' = \frac{2}{3}}$$



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P4



$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$\because n_1 < n_2$$

$$\Rightarrow \sin \theta_1 > \sin \theta_2$$

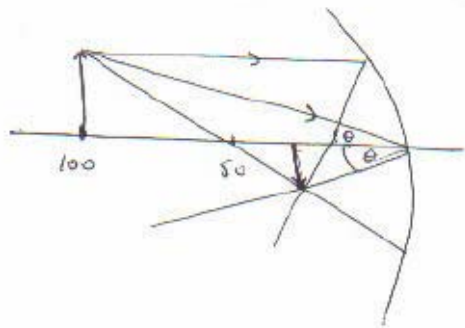
$$\Rightarrow \theta_1 > \theta_2$$

Como  $\sin \theta_1 > \sin \theta_2 \Rightarrow$  el objeto se ve más cerca de lo que realmente está.

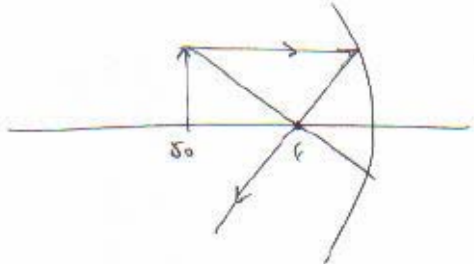
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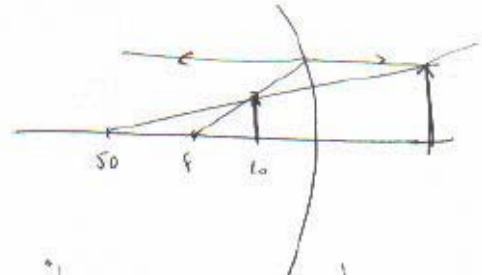
a)



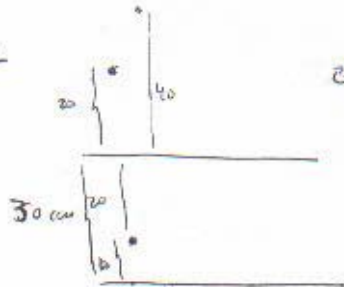
b)



c)



P6



distancias respecto a dicho espejo

Espejo superior	Espejo inferior
$s_1 = 20$	$s_1 = 10$
$s_2 = 40$	$s_2 = 50$
$s_3 = 80$	$s_3 = 70$
$s_4 = 100$	$s_4 = 110$

P7