

11.

PROVA

a) $n_1 \cdot \text{sen } i = n_2 \cdot \text{sen } r$
 $1,532 \cdot \text{sen } 30^\circ = 1 \cdot \text{sen } r$
 $1,532 \cdot \frac{1}{2} = \text{sen } r$

$$\text{sen } r = 0,766$$

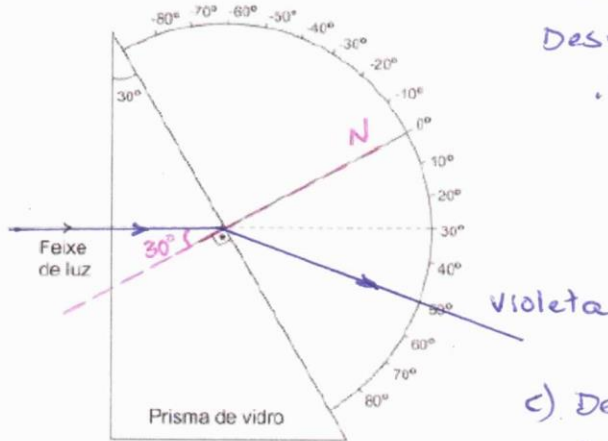
$$\therefore r = 50^\circ$$

$$\text{Desvio} = r - i$$

$$\text{Desvio} = 50 - 30$$

$$\therefore \alpha = 20^\circ$$

b)



c)



c) Desvia mais a cor de luz de maior índice de refração:

$$D_{\text{violeta}} > D_{\text{azul}} > D_{\text{verde}} > D_{\text{amarelo}}$$

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12.

PROVA

a) $\text{tg } \alpha = \frac{0,9}{1}$

$$\therefore \text{tg } \alpha = 0,9$$

b) $n_1 \cdot \text{sen } i = n_2 \cdot \text{sen } r$

$$1,3 \cdot \text{sen } 42^\circ = 1 \cdot \text{sen } r$$

$$1,3 \cdot 0,67 = \text{sen } r$$

$$\text{sen } r = 0,871$$

$$\therefore r = 60^\circ$$

$$\beta + r = 90$$

$$\beta + 60 = 90$$

$$\therefore \beta = 30^\circ$$

c) $\text{tg } \beta = \frac{y}{x}$

$$\text{tg } 30^\circ = \frac{y}{0,3}$$

$$0,58 = \frac{y}{0,3}$$

$$\therefore y = 0,174 \text{ m}$$

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$$b) \frac{y}{d} = \frac{H}{2d}$$

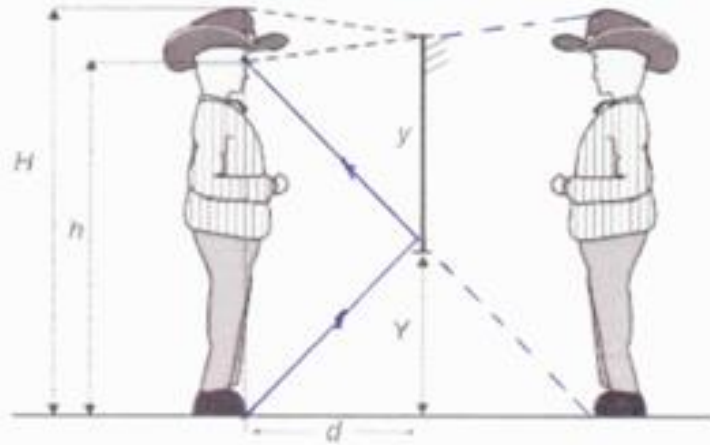
$$1 = \frac{H}{2}$$

$$\therefore H = 2m$$

$$c) \frac{Y}{d} = \frac{h}{2d}$$

$$Y = \frac{1,6}{2}$$

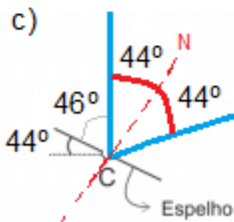
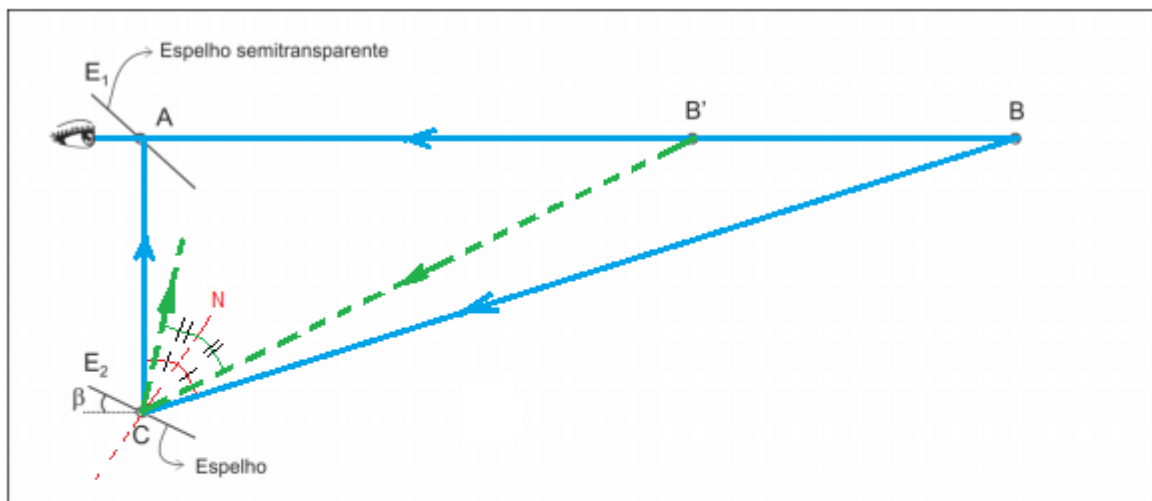
$$\therefore Y = 0,8m$$



d) de acordo com os itens b e c, o tamanho mínimo do espelho e a distância da borda inferior do espelho ao chão independem da distância do rapaz ao espelho. Portanto: $y' = y = 1m$ e $Y' = Y = 0,8m$

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$$44^\circ + 44^\circ + 90^\circ + \gamma = 180^\circ$$

$$\gamma = 2^\circ$$

d)

$$\operatorname{tg} 88^\circ = \frac{\overline{AB}}{\overline{BC}}$$

$$\frac{\operatorname{sen} 88^\circ}{\operatorname{cos} 88^\circ} = \frac{\overline{AB}}{10}$$

$$\frac{0,99}{0,03} = \frac{\overline{AB}}{10}$$

$$\overline{AB} = 330 \text{ cm}$$

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15.

QUADRO DESTINADO À RESPOSTA DA QUESTÃO

TEXTOS ESCRITOS FORA DESTES QUADRO (OU A LÁPIS) NÃO SERÃO CONSIDERADOS PELO CORRETOR

PROVA 3

$$v = \frac{\Delta s}{\Delta t}$$

$$c = \frac{2L}{\Delta t}$$

$$\therefore \Delta t = \frac{2L}{c}$$

$$b) \quad \text{volta} \quad \text{espaços}$$

$$\frac{1}{n} \quad \frac{2nV}{1}$$

$$\therefore n = \frac{1}{2nV}$$

$$f = \frac{n}{\Delta t}$$

$$v = \left(\frac{1}{2n} \right) \frac{1}{\Delta t}$$

$$\therefore \Delta t = \frac{1}{2nV}$$

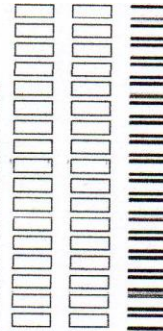
$$c) \quad \Delta t_1 = \Delta t_2$$

$$\frac{2L}{c} = \frac{1}{2nV}$$

$$c = 4LnV$$

$$c = 4 \cdot 8600 \cdot 75 \cdot 12$$

$$\therefore c \approx 3 \cdot 10^8 \text{ m/s}$$



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16.

PROVA 3

$$a) \quad A = \frac{F}{F - P}$$

$$\frac{i}{1,5 \cdot 10^3} = \frac{15}{15 - 1,5 \cdot 10^{11}}$$

$$\therefore i \approx -0,15 \text{ m}$$

$$\text{Diâmetro da imagem} \approx 0,15 \text{ m}$$

$$b) \quad I = \frac{P}{A}$$

$$1000 = \frac{P_{\text{espelho}}}{\pi \cdot 5^2}$$

$$\therefore P_{\text{espelho}} = 75000 \text{ W}$$

$$I = \frac{P}{A}$$

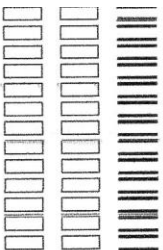
$$I_{\text{imagem}} = \frac{75000}{\pi \cdot 0,075^2}$$

$$\therefore I_{\text{imagem}} \approx 4,4 \cdot 10^6 \text{ W/m}^2$$

$$c) \quad P = \frac{E}{\Delta t}$$

$$75000 = \frac{0,6 \cdot 10^3 \cdot 1 \cdot \Delta T}{4}$$

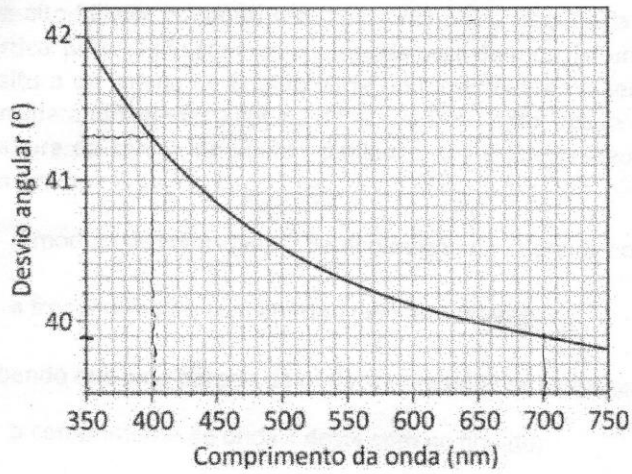
$$\therefore \Delta T = 500 \text{ K}$$



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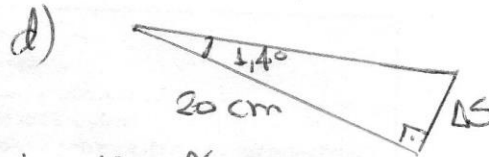
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a) $f = 30 \text{ mm}$
(entre pelo foco, sai paralelo)

b) $\text{nor. sen } i = n_p \cdot \text{sen } r$
 $1 \cdot \text{sen } i = 1,53 \cdot \text{sen } 30$
 $\text{sen } i = 0,765$
 $\therefore i \approx 50^\circ$

c) $d_{\text{violeta}} = 41,3^\circ$
 $d_{\text{verm}} = 39,9^\circ$ } dados do gráfico
 $\Delta d = 41,3 - 39,9$
 $\therefore \Delta d = 1,4^\circ$



$$\text{tg } 1,4^\circ = \frac{\Delta s}{20}$$

$$\frac{1,4}{60} = \frac{\Delta s}{20} \Rightarrow \Delta s \approx 0,47 \text{ cm}$$

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