

Workshop # 4

$$\begin{aligned} \textcircled{1} \quad a) \quad I_1 &= I_0 \cos^2 \theta \\ &= 100 \text{ W/m}^2 \cos^2 (20^\circ) \\ &= 88.3 \text{ W/m}^2 \end{aligned}$$

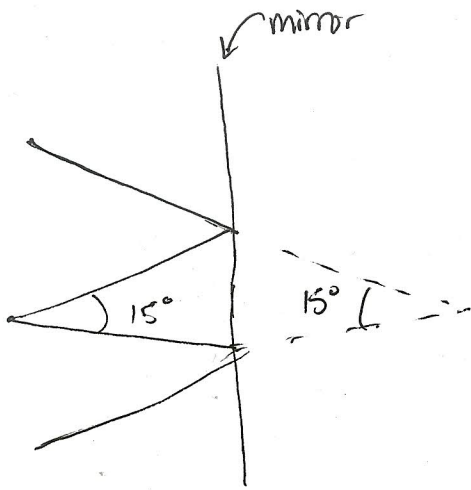
$$\begin{aligned} I_2 &= 88.3 \text{ W/m}^2 \cos^2 (110^\circ - 20^\circ) \\ &= 0 \text{ W/m}^2 \end{aligned}$$

$$\begin{aligned} b) \quad I_1 &= I_0 \cos^2 \theta \\ &= 100 \text{ W/m}^2 \cos^2 (60^\circ) \\ &= 25 \text{ W/m}^2 \end{aligned}$$

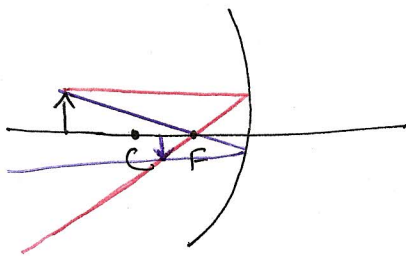
$$\begin{aligned} I_2 &= 25 \text{ W/m}^2 \cos^2 (60^\circ - 20^\circ) \\ &= 14.7 \text{ W/m}^2 \end{aligned}$$

$$\begin{aligned} c) \quad I_3 &= 14.7 \text{ W/m}^2 (\cos^2 (110^\circ - 20^\circ)) \\ &= 0 \end{aligned}$$

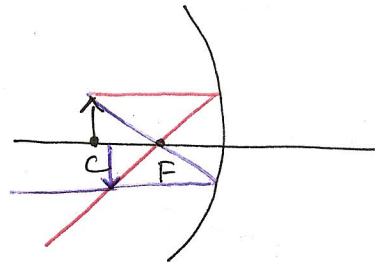
2.



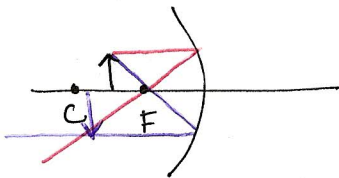
3) a) beyond C



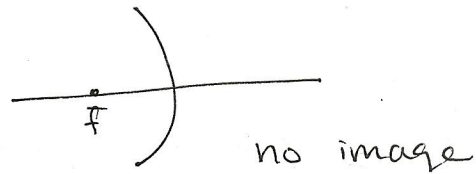
b) at C



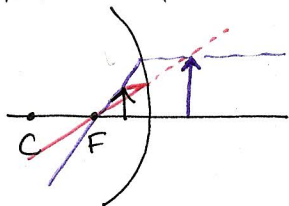
c) between C & F



d) at F



e) between F & mirror

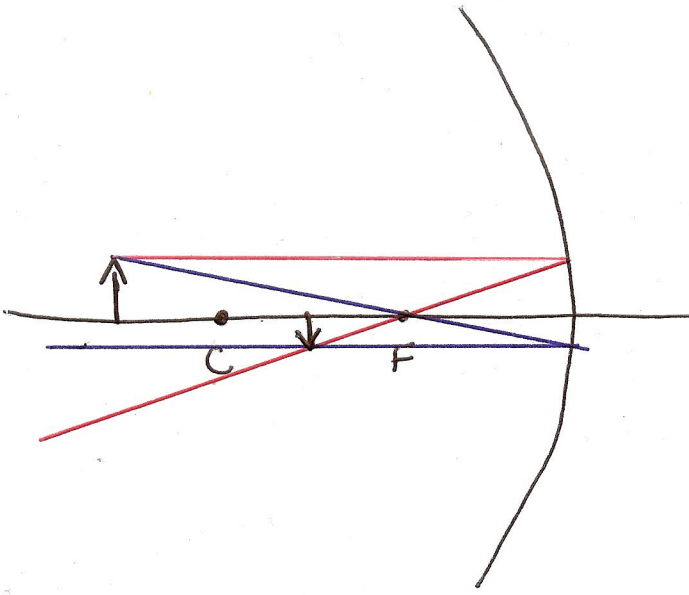


Beyond

4.) $h_i = 2 \text{ cm}$ (same as object but inverted)

5.

II)



distance:

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$$

$$\frac{1}{d_o} - \frac{1}{f} = \frac{1}{d_i}$$

$$\frac{1}{7\text{cm}} - \frac{1}{2.5\text{cm}} = \frac{1}{d_i} \Rightarrow d_i = 3.89\text{cm}$$

height

$$\left(-\right) \frac{d_i}{d_o} = \frac{h_i}{h_o} = \frac{3.89\text{cm}}{7\text{cm}}$$

$$\Rightarrow -0.554 \frac{h_i}{1.5\text{cm}} \Rightarrow h_i = -0.83\text{cm}$$

