REFLECTION AT CURVED SURFACES

1.

Solution

$$f_{convex} = \frac{r}{2} = \frac{-7.24\ \text{m}}{2} = -3.62\ \text{m}$$

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

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

$$d_i = \frac{(-3.62\ \text{m})(15.5\ \text{m})}{(15.5\ \text{m}) - (-3.62\ \text{m})} = -2.93\ \text{m}$$

2.

a) 30 cm [1m]

b) -2.0 [1m]

c) real, inverted, larger, beyond 2f[2m]

3.

a) 12 cm [1m]

b) 3.6 cm [1m]

4.

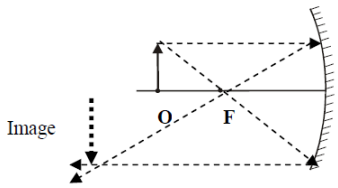
Answer: **d_i = 22.5 cm** and **h_i = -2.5 cm**

Use $1/f = 1/d_o + 1/d_i$ where f = 15 cm and d_o = 45 cm [2m]

Then use $h_i / h_o = - d_i / d_o$ where h_o = 5 cm, d_o = 45 cm, and d_i = 22.5 cm [1m]

5.

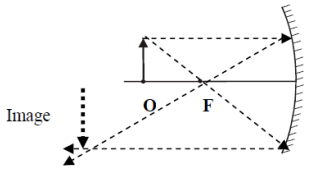
Ans



Object beyond F [1m]
Rays from object to image [1m]
Image position correct [1m]

6.

Ans



Object beyond F [1m]
Rays from object to image [1m]
Image position correct [1m]

7.

a) -13.3 cm [1m]

b) 0.33 [1m]

c) 20 cm [1m]

d) virtual, erect, smaller, behind mirror[1m]