**Answer on Question #43125-Physics-Optics**

Unknown spherical mirror is used to form an erect image three times the original size for an object placed at distance 15cm from it find

1-the image position

**Solution**

The magnification of a mirror is defined as the height of the image divided by the height of the object:

$$m = \frac{h_i}{h_o} = -\frac{d_i}{d_o}.$$

The image position is

$$d_i = -3 \cdot 15 \text{cm} = -45 \text{cm}.$$

I.e. image is located at distance 45cm from the mirror on the other side of the source object.

2-the focal length

**Solution**

From the mirror equation

$$\frac{1}{d_0} + \frac{1}{d_i} = \frac{1}{f}$$

the focal length is

$$f = \frac{1}{\frac{1}{d_0} + \frac{1}{d_i}} = \frac{1}{\frac{1}{15} + \frac{1}{-45}} = 22.5 \ cm.$$

3-the kind of the mirror

**Answer**

The image is erect and larger than origin, that's why this is a concave spherical mirror.