



where;

H_i =height of the image

H_o =height of the object

D_i =distance between image and mirror

D_o =distance between object and mirror

$$H_i = 3H_o$$

$$\frac{H_i}{H_o} = \frac{D_i}{D_o} = 3 \quad \text{Where, } D_i = X \text{ and } D_o = 120 - X$$

$$D_i = 3D_o$$

$$X = 3(120 - X)$$

$$X = D_i = 90\text{cm}$$

$$D_o = 30\text{cm}$$

$$\frac{1}{f} = \frac{1}{D_o} + \frac{1}{D_i}$$

$$\frac{1}{f} = \frac{1}{30\text{cm}} - \frac{1}{90\text{cm}} \quad \text{(Since image is formed behind the mirror we put "-" sign in front of it.)}$$

$$f = 45\text{cm}$$