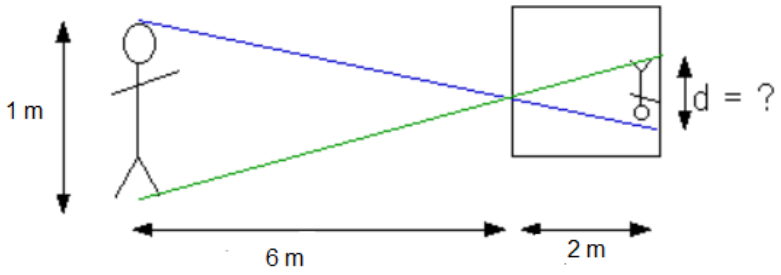
Answer on Question #46972, Physics, Optics

A camera obscura used by a potrait painter is located 6 m from a child who stands 1 m tall. How tall is her image if the back of the camera obscura is 2 m away?

Solution:



The triangle formed by the object (the child) and the rays from the child's head and feet going to the pin-hole and the triangle formed by the image and the rays coming from the pin-hole toward the head and feet of the image are similar triangles so the ratios of corresponding sides of these triangles are equal. That is,

$$\frac{d}{2\ \text{m}} = \frac{1\ \text{m}}{6\ \text{m}}$$

Thus,

$$d = \frac{2}{6} = \frac{1}{3} = 0.33\ \text{m}$$

Answer: $d = 0.33\ \text{m}$