A person is approaching a plane mirror with speed 10cm/sec. if the initial distance between person and mirror is 1m.then the distance between person and his image after 2.5sec will be??

Solution

The distance between person and his image is doubled distance between person and mirror. So the initial distance between person and his image:

$$d_0 = 2 * 1m = 2\ m.$$

When person is approaching a plane mirror with speed V his image also approach a plane mirror with speed V. So the approach speed between person and his image is

$$V_{app} = V + V = 2V = 2 * 10 \frac{cm}{s} = 20 \frac{cm}{s} = 0.2 \frac{m}{s}.$$

The distance between person and his image after 2.5sec will be

$$d = d_o - V_{app} * t = 2 - 0.2 * 2.5 = 1.5\ m.$$

Answer: $1.5\ m$.