Answer on Question #53207, Physics / Mechanics | Kinematics | Dynamics

A man of height 1.2 m walks away from a lamp hanging at height of 4 m above ground. If man walks with a speed of 2.8m/s determine velocity of the tip of mans shadow.

Solution:



Let the lamp be at A at height H from the ground, that is AB = H. Let the man be initially at B, below the lamp, his height being equal to BD = h, so that the tip of his shadow is at B. Let the man walk from B to F in time t with speed v, the shadow will go up to C in the same time t with speed v':

$$BF = vt$$
$$BC = v't$$

From similar triangles EFC and ABC

$$\frac{FC}{BC} = \frac{EF}{AB} = \frac{h}{H}$$
$$\frac{v't - vt}{v't} = \frac{h}{H}$$

or

$$v' = \frac{Hv}{H-h} = \frac{4*2.8}{4-1.2} = 4$$
 m/s

Answer: 4 m/s