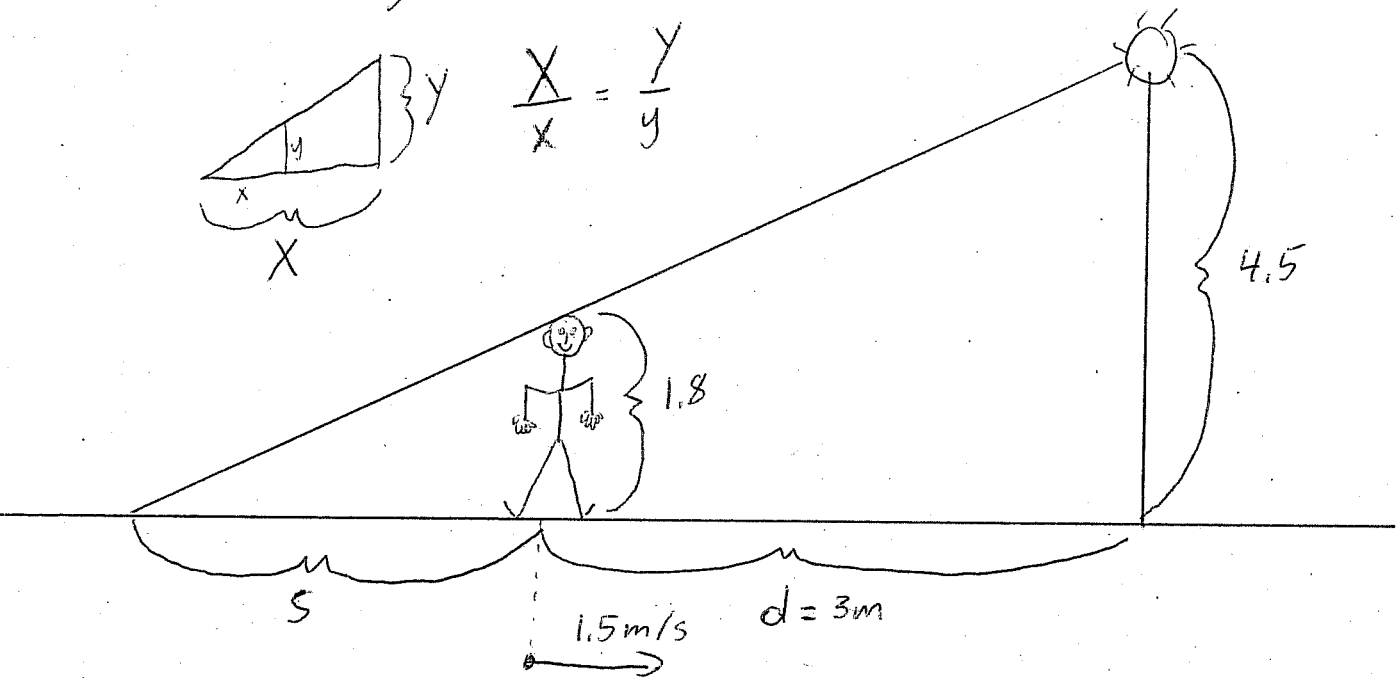


35) A man 1.8 m tall approaches a street light 4.50 m above the ground at a rate of 1.5 m/s. How fast is the end of the man's shadow moving when he is 3.00 m from the base of the light?



note: That the speed is calculated with respect to the lamp post i.e. Let  $X = s + d$

$$y = 1.8$$

$$Y = 4.5$$

$$x = s$$

$$\leftarrow s = X - d$$

We are looking for  $X'$  and we know  $d' = 1.5$   
 $d = 3$

$$\therefore \frac{X}{x} = \frac{Y}{y}$$

$$\frac{X}{s} = \frac{4.5}{1.8}$$

$$\frac{X}{X-d} = \frac{4.5}{1.8}$$

$$1.8X = 4.5(X-d)$$

$$4.5d = 2.7X$$

$$X = \frac{4.5d}{2.7}$$

$$X' = \frac{4.5d'}{2.7}$$

$$X' = \frac{4.5(1.5)}{2.7} = 2.5 \text{ m/s}$$