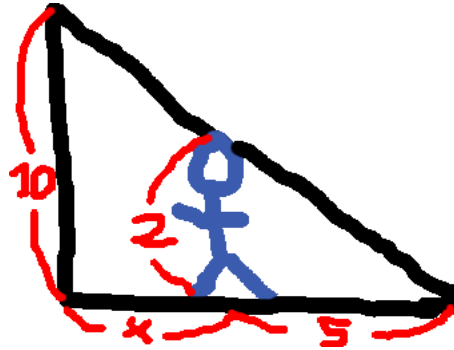


Problem 1 (8 points). A man is walking away from a lamppost with a light source 10m above the ground. The man is 2m tall. How far away is the man from the lamppost when his shadow is 5m long?

Solution. First, draw a diagram:



By similarity of triangles, we see that the equation that properly models the situation described above is

$$\frac{10}{x+5} = \frac{2}{5},$$

which is equivalent to solving

$$10 \cdot 5 = 2(x+5).$$

Dividing each side by 2, we obtain

$$25 = x+5,$$

and so

$$x = 20.$$

□

Problem 2 (2 points). Solve $x^2 + 30x + 200 = 0$.

Solution. $(x+10)(x+20) = 0$, and so $x = -10$ or -20 .

□