

Problem 1 (8 points). A man is walking away from a lamppost with a light source 10m above the ground. The man is standing 20m away from the lamppost, and his shadow is 5m long. How tall is the man?

Solution. First, draw a diagram:



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

$$\frac{10}{20 + 5} = \frac{x}{5},$$

which is equivalent to solving

$$10 \cdot 5 = x(20 + 5).$$

Simplifying, we obtain

$$50 = 25x$$

and so

$$x = 2.$$

□

Problem 2 (2 points). Solve $x^2 + 25x + 100 = 0$.

Solution. $(x + 20)(x + 5) = 0$, and so $x = -20$ or -5 .

□