1 *A tree casts a shadow of 25 feet. At the same time of day, a 6-foot-tall man casts a shadow of 2.5 feet. How tall is the tree? (Show* at least *what equation you use to solve this problem, as well as your final answer in words.)*

I'll set up the proportion so that the tree is on the left-hand-side, the man is on the right, their heights are in the numerators, and their shadow lengths are in the denominators. (There are seven other correct ways to set it up.)

$$\begin{aligned} \frac{x}{25} &= \frac{6}{2.5}; \\ 2.5x &= 6 \cdot 25; \\ \frac{5}{2}x &= 150; \\ 5x &= 300; \\ x &= 60. \end{aligned}$$

Therefore, the tree is 60 **feet tall** (which makes sense).

2 *A building is divided into three equal portions. It took José 9 hours to paint one portion. It took Joaquín 12 hours to paint another portion. If they work together on the third portion, how long will it take them? (Show* at least *what equation you use to solve this problem, as well as your final answer in words. You may round your answer to the nearest tenth of an hour if you wish.)*

José works at a speed of 1/9 portion per hour, and Joaquín works at a speek of 1/12 portion per hour, so their combined speed is the sum of these. If they take x hours to complete the third portion, then their combined speed must be $1/x$ portion per hour. Therefore,

$$\begin{aligned} \frac{1}{9} + \frac{1}{12} &= \frac{1}{x}; \\ 36x\left(\frac{1}{9} + \frac{1}{12}\right) &= 36x\left(\frac{1}{x}\right); \\ \frac{36x}{9} + \frac{36x}{12} &= \frac{36x}{x}; \\ 4x + 3x &= 36; \\ 7x &= 36; \\ x &= \frac{36}{7}. \end{aligned}$$

Therefore, it will take them 36/7 **hours** or **approximately** 5.1 **hours** (which makes sense).