# 2. Inventing Rules

**First & Last Name:** _____ **Class:** _____


In working with similar triangles, you often have to solve equations involving proportions.

Suppose one triangle has sides of lengths 6, 9, and 14. Suppose there is a similar triangle with shortest side of length 15. To find the longest side of the second triangle, represent it with $x$ and find the value of $x$ that satisfies this equation.

$$\frac{6}{15} = \frac{14}{x}$$

This is one of several possible equations for $x$.

Some equations of this kind are easier to solve than others. Sometimes the particular numbers involved suggest shortcuts that make them easy to solve.

In each equation, the letter $x$ stands for an unknown number. Use any method you like to find what the number $x$ stands for. Write down exactly how you do it.

Be sure to check your answers.

**1.** $\frac{x}{5} = 7$

**2.** $\frac{x}{6} = \frac{72}{24}$

**3.** $\frac{x}{8} = \frac{11}{4}$

**4.** $\frac{x}{7} = \frac{5}{3}$

**5.** $\frac{x+1}{3} = \frac{4}{6}$

**6.** $\frac{5}{13} = \frac{19}{x}$

**7.** $\frac{2}{x} = 6$

**8.** $\frac{9}{x} = \frac{x}{16}$

**9.** For each ratio in Question 4 and 8, draw a pair of similar triangles with side lengths that would create the ratios in the proportion.

**10.** Use any method you wish to solve for the unknown number in this proportion. Draw a pair of similar triangles that would reflect this proportion:

$$\frac{x+3}{7} = \frac{x}{3}$$