PROPORTIONS

A **proportion** is an equation that shows that two ratios (or fractions) are ***equivalent.***

To check to see if a pair of ratios are equivalent, we must **cross multiply.**

$\frac{a}{b} = \frac{c}{d}$

$a \times d = b \times c$

$\frac{2}{3} \neq \frac{8}{24}$

$3 \times 8 \neq 2 \times 24$

$24 \neq 48$

Since the numbers are **NOT** equal, this is **NOT** a **proportion.**

We also **cross multiply** to solve for a missing value x.

$\frac{16}{5} = \frac{x}{25}$

$5 \times x = 16 \times 25$

$5x = 400$

$\frac{5x}{5} = \frac{400}{5}$

$x = 80$

$\frac{6}{8} = \frac{24}{x}$ $\quad \frac{8.2}{x} = \frac{32.8}{16}$

$\frac{5}{9} = \frac{x}{63}$ $\quad \frac{x}{31.5} = \frac{8}{14}$

★ GUIDED PRACTICE ★

Check if each pair of ratios is equivalent by **cross multiplying.**

1. $\frac{2}{3} = \frac{8}{24}$
2. $\frac{9}{7} = \frac{54}{42}$
3. $\frac{3.8}{6} = \frac{19}{31}$

Solve each proportion for the missing value x.

4. $\frac{6}{8} = \frac{24}{x}$
5. $\frac{8.2}{x} = \frac{32.8}{16}$
6. $\frac{5}{9} = \frac{x}{63}$
7. $\frac{x}{31.5} = \frac{8}{14}$

Scale factor is the ratio of the size of a model to its actual size. Set up a proportion to solve!

$$\text{Scale} = \frac{MODEL}{ACTUAL}$$

8. The scale on a map of shows that 2 inches represents 27 miles. If the distance on the map is 12 inches, how many miles is the actual distance?



9. The box of a model airplane stated the plane has a scale factor of 1 to 144. If the model is 1.4 feet long, how many feet long is the actual plane?

