



# Math

## Warm-Ups

- ① Distribute
- ② Addition Property of Eq.
- ③ Mult. Prop. of Equality
- ④ Subt. Prop. of Equality
- ⑤ Div. Prop. of Eq.

## Warm Up: Solve & Check

$$\frac{2(x+4)}{3} - 8 = 32$$

$$\frac{2x+8}{3} - 8 = 32$$

$$\frac{2x+8}{3} + 8 = 32 + 8$$

$$2x+8 = 40$$

$$2x+8 - 8 = 40 - 8$$

$$2x = 32$$

$$x = 16$$

## Solving Proportions

Proportion—

two equal ratios (or fractions)



Examples

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

$$\frac{2}{3} = \frac{10}{x}$$

$$\frac{4}{5} = \frac{16}{x}$$

NON-Examples

$$2x = 10$$

$$4x + 3$$

$$5x + 10$$



**What We Do...**

Cross  
Multiplication  
 $\frac{a}{b} = \frac{c}{d}$   
 $ad = bc$



$\frac{7}{8} = \frac{m}{12}$ $7(12) = 8(m)$ $\frac{84}{8} = \frac{8m}{8}$ $(10.5) = \frac{21}{2} = m$	<p>check: <math>\frac{7}{8} = \frac{10.5}{12}</math>  <math>.875 = .875</math> ✓</p>	$\frac{b}{6} = \frac{4}{5}$ $\frac{5b}{5} = \frac{24}{5}$ $b = 4.8$
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$$\frac{b-8}{5} = \frac{b+3}{4}$$

$$4(b-8) = 5(b+3)$$

<del>4</del>   $b-32$	$= 5b+15$
<del>-4b</del>	<del>-4b</del>
$-32 = b+15$	
<del>-15</del>	<del>-15</del>
$-47 = b$	



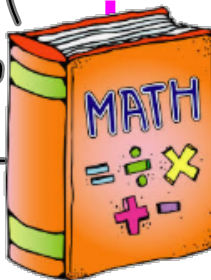
variables Cross multiply  
if you see 2  
equal fractions.

$$\frac{b-2}{9} = \frac{b+6}{18}$$

$$18(b-2) = 9(b+6)$$

$$\begin{array}{r} 18b - 36 = 9b + 54 \\ -9b \quad \quad -9b \\ \hline 9b - 36 = 54 \\ +36 \quad +36 \\ \hline 9b = 90 \\ \div 9 \quad \div 9 \\ \hline b = 10 \end{array}$$

$$b = 10$$



$$\frac{x-2}{3} = \frac{5}{6}$$

$$6(x-2) = 15$$

$$\begin{array}{r} 6x - 12 = 15 \\ +12 \quad +12 \\ \hline 6x = 27 \\ \div 6 \quad \div 6 \\ \hline x = \frac{27}{6} \end{array}$$

$$x = \frac{9}{2} = 4.5$$

Work with your partner to solve the problems on the next few slides.

**Solve each proportion. Show proper algebraic work.**

1.  $\frac{3}{6} = \frac{x-3}{8}$



2.  $\frac{x-1}{-4} = \frac{2}{3}$



3.  $\frac{x+3}{4} = \frac{7}{8}$

$$4. \frac{7}{12} = \frac{a-6}{5}$$

$$5. \frac{8}{9} = \frac{w-2}{6}$$

$$6. \frac{5}{2-x} = \frac{7}{10}$$

$$7. \frac{3+x}{8} = \frac{7}{12}$$

$$8. \frac{3}{5} = \frac{y+1}{9}$$

$$9. \frac{x+3}{3} = \frac{10+4}{4}$$



**HOMework! HOMework! HOMework!**  
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**10.**  $\frac{x+7}{7} = \frac{15}{5}$

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

**12.**  $\frac{5}{7} = \frac{x-2}{4}$