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Solving Proportions

$\boxed{\frac{3}{4} = \frac{x}{8}}$

Solve the following proportions.

1. $\frac{3}{4} = \frac{x}{8}$

$3(8) = 4(x)$

$\frac{24}{4} = \frac{4x}{4}$

$6 = x$

2. $\frac{2}{5} = \frac{8}{x}$

$x = 20$

3. $\frac{x}{6} = \frac{10}{3}$

$\frac{3x}{3} = \frac{60}{3}$

$x = 20$

4. $\frac{3}{x} = \frac{9}{5}$

$\frac{15}{9} = \frac{9x}{9}$

$\frac{15}{9} = x$

$1.\overline{66} = x$

$\frac{3}{4} = \frac{x-2}{8}$

$\frac{3}{4} = \frac{8-2}{8}$

$\boxed{\frac{3}{4} = \frac{6}{8}}$

Solve the following proportions.

1. $\frac{3}{4} = \frac{x-2}{8}$

$3(8) = 4(x-2)$ ✓

$24 = 4x - 8$

$+8 \qquad +8$

$\frac{32}{4} = \frac{4x}{4}$

$x = 8$

2. $\frac{2}{5} = \frac{8}{(x-4)}$

$2(x-4) = 5(8)$

$2x - 8 = 40$

$+8 \quad +8$

$\frac{2x}{2} = \frac{48}{2}$

$x = 24$

3. $\frac{2x-3}{3} = \frac{9}{3}$

$27 = 6x - 9$

$+9 = +9$

$\frac{36}{6} = \frac{6x}{6}$

$x = 6$

4. $\frac{4}{3x-2} = \frac{2}{5}$

$20 = 6x - 4$

$+4 \quad +4$

$24 = 6x$

$x = 4$

Solve the following proportions.

1. $\frac{3x}{4} = \frac{x-5}{3}$

$3x(3) = 4(x-5)$

$9x = 4x - 20$

$-4x \quad -4x$

$\frac{5x}{5} = \frac{-20}{5}$ $x = -4$

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

$x = -2$

3. $\frac{4x-3}{3} = \frac{5x}{3}$

$x = -3$

4. $\frac{4}{3x-20} = \frac{2}{5x}$

$x = -2.85 = -\frac{40}{14}$

Solve the following proportions.

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

$4(x-5) = 3(3x+1)$

$4x-20 = 9x+3$

$-4x \qquad -4x$

$-20 = 5x+3$

$-3 \qquad -3$

$\frac{-23}{5} = \frac{5x}{5}$

$x = \frac{-23}{5} = -4.6$

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

3. $\frac{4x-3}{5x+2} = \frac{2}{3}$

4. $\frac{4x+1}{3x-20} = \frac{2}{5}$

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Set up a proportion to solve each problem, show all work, and label all answers.

1. The ratio of boys to girls is 4 to 3. If there are 36 boys, how many girls are there?

$\frac{\text{boys}}{\text{girls}}$ $\frac{4}{3} = \frac{36}{x}$

$\frac{4x}{4} = \frac{108}{4}$

$x = 27$

$\frac{4}{3} = \frac{36}{x}$ ×9 ×9

2. At a recent party, it cost $11.50 for refreshments for 6 guests. At this rate, how much would it cost to have refreshments for 80 guests?

$\frac{\text{guests}}{\text{guests}}$ $\frac{80}{6} = \frac{x}{11.50}$

$\frac{\text{Money}}{\text{guests}}$ $\frac{\$11.50}{6} = \frac{x}{80}$

$\frac{6x}{6} = \frac{920}{6}$ $x = \$150.33$

3. Mr. Johnson was paid $2250 for a job that required 30 hours of work. At this rate, how much should he be paid for a job requiring 45 hours of work?

$\frac{\$}{\text{hrs}}$ $\frac{2250}{30} = \frac{x}{45}$

$\frac{30x}{30} = \frac{101250}{30}$

$\boxed{x = 3375}$

$\frac{30}{45} = \frac{2250}{x}$

4. If a jogger runs 3 miles and burns 221 calories, how many calories would he burn jogging 4 miles?

5. Central High School has 1675 students. The student to teacher ratio is 21 to 1. How many teachers are at Central High School?

$$\frac{21}{1} = \frac{1675}{x}$$

$$\cancel{\frac{21}{1} = \frac{x}{1675}}$$

$$\cancel{x = 35175}$$

6. A recipe calls for $2\frac{3}{4}$ cups of flour to make 2 dozen cookies. How many cups of flour would be required to bake 11 dozen cookies?

$\frac{\text{flour}}{\text{cookies}}$

$$\frac{2\frac{3}{4}}{2} = \frac{x}{11}$$

$$\frac{2.75}{2} = \frac{x}{11}$$

$$\frac{\left(\frac{11}{4}\right)}{2} = \frac{x}{11}$$