

# Proportions and Percents

## Proportions:

A proportion is a statement that two ratios are equal. When trying to solve proportions we use the Cross Products Property of Proportions.

$$\frac{A}{B} = \frac{C}{D} \quad A(D) = B(C)$$

Example:

$$\frac{6}{11} = \frac{x}{121}$$

$$6(121) = 11x$$

$$726 = 11x$$

$$\frac{726}{11} = \frac{11x}{11}$$

$$66 = x$$

$$\frac{x+5}{12} = \frac{1.5}{6}$$

$$6(x+5) = 12(1.5)$$

$$6x + 30 = 18$$

$$\frac{-30}{-30} \quad \frac{-30}{-30}$$

$$\frac{6x}{6} = \frac{-12}{6}$$

$$x = -2$$

**Do with videos (Links on Algebra 1 page):**

$$1) \frac{x+4}{8} = \frac{x-3}{36}$$

$$2) \frac{x-3}{x+2} = \frac{2x-7}{x+10}$$

## Percents:

$$\frac{\text{Is}}{\text{Of}} = \frac{\%}{100}$$

Example:

What number is 20% of 50?

$$\begin{array}{l} \text{Is:} \quad ? \rightarrow x \\ \text{Of:} \quad \text{of } 50 \end{array} \quad \frac{x}{50} = \frac{20}{100}$$

$$\%: \quad 20\%$$

$$100: \quad 100$$

$$100x = 20(50)$$

$$100x = 1,000$$

$$\frac{100x}{100} = \frac{1,000}{100}$$

$$x = 10$$

## Do with videos (Links on Algebra 1 page):

a) What number is 40% of 160?

b) 48 is what percent of 128?

c) 28 is 75% of what number?

d) What number is 36% of 400?

**Do with videos (Links on Algebra 1 page):**

**Word Problem Example:**

1) In the 640 student freshman class, 224 failed biology. What percent of the class failed biology?

2) In the 720 student freshman class, 155% failed biology. What percent of the class passed biology?

**Part I:**

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$$1) \frac{x}{12} = \frac{18}{54}$$

$$2) \frac{-13}{x} = \frac{65}{90}$$

$$3) \frac{x+4}{9} = \frac{6x}{18}$$

$$4) \frac{-16}{6x-2} = \frac{8}{11}$$

$$5) \frac{14}{16} = \frac{3x}{3x+3}$$

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6) What is 20% of 32?

7) 72 is 40% of what number?

8) 21.56 is what percent of 98?

9) - 31 is what percent of -124?

10) What is 62% of 140?

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$$11) \frac{-9}{7} = \frac{3x+6}{126}$$

$$12) \frac{x+1}{x-5} = \frac{x-1}{2x-2}$$

$$13) \frac{11}{x-4} = \frac{x+3}{4}$$

$$14) \frac{x+6}{2x+2} = \frac{x+12}{x+4}$$

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$$15) \frac{11}{x-4} = \frac{x+3}{4}$$

$$16) \frac{2x+6}{x-1} = \frac{x+3}{x-3}$$

17) What is 80% of 850?

18) 128 is 32% of what number?

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19) 72 is what percent of 120?

20) What is 80% of 850?

$$21) \frac{2x-4}{x+5} = \frac{x-2}{x+1}$$

$$22) \frac{x+7}{2x-1} = \frac{x+6}{x-2}$$



## Extra Unit Review:

$$1) \frac{x}{16} = \frac{39}{156}$$

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

$$3) \frac{x+1}{x-7} = \frac{2x-3}{x-6}$$

$$4) \frac{141}{x} = \frac{3}{11}$$

*Will not be submitted.*

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$$5) \frac{7}{4x+5} = \frac{11}{8x+7}$$

$$6) \frac{2x-5}{x+2} = \frac{x+10}{x-4}$$

$$7) \frac{13}{220} = \frac{x}{550}$$

$$8) \frac{6}{13} = \frac{6x}{12x+2}$$

*Will not be submitted.*

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$$9) \frac{x-2}{x+4} = \frac{2x-4}{x+5}$$

10) 174.15 is what percent of 645?

11) What is 45% of 275?

12) 2,184 is 78% of what number?

13) On a map of the US,  $\frac{3}{4}$  of an inch = 183 miles. How many inches represent 976 miles?

14) 350 people were polled on who they would vote for, the Smart kid or the Funny kid. 64% said the Funny kid. How many people voted for the Smart kid?

15) There are 16 ounces in 1 pound. How many ounces are there in 22.5 pounds?

16) In the 700 student freshman class, 567 passed math. What percent of the class failed math?

17) On Chelsea's home planet a 136 pound person weighs 17 pounds. What would the earth weight be of a person who weighs 24 pounds on Chelsea's home planet?

## Extra Unit Review Answer Key:

- 1) 4   2) 5   3)  $x = \{3,9\}$    4) 517   5) .5   6)  $x = \{0,25\}$    7) 32.5  
8) 2   9)  $x = \{-3,2\}$    10) 27%   11) 123.75   12) 2,800   13) 4 inches  
14) 126 people   15) 360 ounces   16) 19% failed   17) 192 pounds