

Algebra 1 Chapter 4 Pre-Test

1. (5 pts each, 15 points total) Solve each of the following proportions.

a)  $\frac{2}{3} = \frac{10}{t}$

*Handwritten work:* A circular diagram showing the steps to solve the proportion. It starts with  $\frac{2}{3} = \frac{10}{t}$ . An arrow labeled  $\times 5$  points to  $\frac{2 \times 5}{3 \times 5} = \frac{10}{t}$ . Another arrow labeled  $\times 5$  points to  $\frac{10}{t} = \frac{10}{t}$ . A final arrow labeled  $\times 5$  points to  $15$ , which is circled.

*Handwritten work:* Cross multiply:  $\frac{2}{3} \times \frac{10}{t}$  with the text "Cross multiply" and arrows. This leads to  $\frac{2t}{2} = \frac{30}{2}$ , and finally  $t = 15$  is boxed.

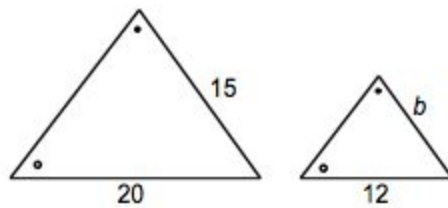
b)  $\frac{4}{5} = \frac{k}{9}$

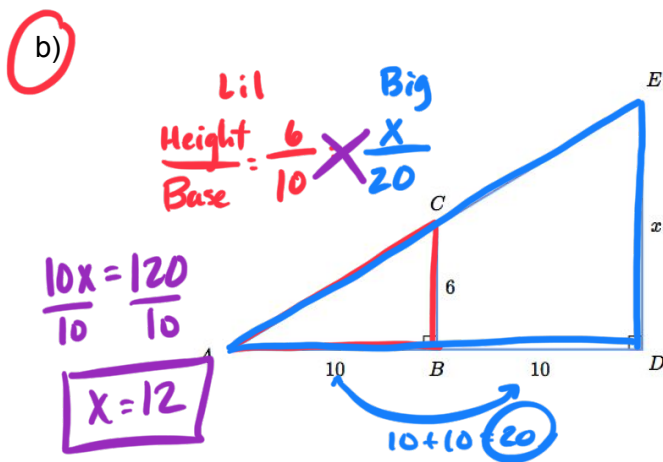
c)  $\frac{x+2}{x-2} = \frac{4}{8}$

*Handwritten work:* Cross multiply:  $\frac{x+2}{x-2} \times \frac{4}{8}$ . This leads to  $8(x+2) = 4(x-2)$ . Then  $8x + 16 = 4x - 8$ . Subtract  $4x$  from both sides:  $4x + 16 = -8$ . Subtract  $16$  from both sides:  $4x = -24$ . Divide by  $4$ :  $x = -6$  is boxed.

2. (5 pts each, 10 points total) Each pair of figures is similar. Find the length of x.

a)





3. (5 pts each, 15 points total) Solve each problem.

a) What is 36% of 80?

$x = 0.36 * 80$

$x = 28.8$

b) What percent of 90 is 27?

$x * 90 = 27$

$\frac{90x}{90} = \frac{27}{90}$

$x = \frac{27}{90} = 0.3 * 100$

$30\%$

c) 84% of what is 21?

$0.84 * x = 21$

$\frac{0.84x}{0.84} = \frac{21}{0.84}$

$x = \frac{21}{0.84} = 25$

4. (5 pts each, 20 points total) Find each percent of change. Describe the percent of change as an increase or decrease.

a)  $\overset{\text{old}}{\text{\$88}}$  to  $\overset{\text{new}}{\text{\$120}}$

$$\frac{120 - 88}{88} = \frac{32}{88} = 0.364 * 100\% = \boxed{36.4\%}$$

$\frac{\text{New-old}}{\text{old}} * 100\%$

- b) 45 cm to 25 cm

c)  $\overset{\text{old}}{1240}$  mi to  $\overset{\text{new}}{560}$  mi

$$\frac{560 - 1240}{1240} = \frac{-680}{1240} = -0.548 * 100\% = -54.8\%$$

$\boxed{54.8\% \text{ decrease}}$

- d) In 1980, the average price of a movie ticket was \$2.09. In 2017, the average price was \$8.65. What was the percent of change?

5. (5 pts each, 20 points total) Since 1996, there have been 25 Super Bowls. Of these, the New England Patriots have represented the AFC 10 times, the Denver Broncos 4 times, and the Pittsburgh Steelers 4 times. Use this information to answer the following:

a) What is the probability the New England Patriots would represent the AFC during this time?

$$\frac{10 \div 5}{25 \div 5} = \boxed{\frac{2}{5}}$$

b) What is the probability that the Denver Broncos or Pittsburgh Steelers would represent the AFC during this time?

c) What is the probability that another team other than the New England Patriots, Denver Broncos or Pittsburgh Steelers would represent the AFC during this time?

$$\frac{25 - (10 + 4 + 4)}{25} = \frac{25 - 18}{25} = \boxed{\frac{7}{25}}$$

d) What is the probability that Pittsburgh was not a representative during this time?

6. (5 pts each, 10 points total) Suppose Claire has a bag of candy containing 8 Snickers bars, 6 Kit-Kats, and 4 Reese's Cups. Find each probability.

Total: 18

- a) P(Kit-Kat then Reese's Cup) with replacing

$$\frac{6}{18} = \frac{1}{3} \quad \frac{4}{18} = \frac{2}{9} \quad \frac{1}{3} * \frac{2}{9} = \boxed{\frac{2}{27}}$$

- b) P(Snickers then Kit-Kat) with replacing

- c) P(Reese's Cup then Reese's Cup) without replacing

$$\frac{4}{18} = \frac{2}{9} \quad \frac{3}{17} \quad \frac{2}{9 \div 3} * \frac{3}{17} = \frac{2}{3} * \frac{1}{17} =$$

$$\boxed{\frac{2}{51}}$$

- d) P(Kit-Kat then Reese's Cup) without replacing