

Chapter 4 Study Guide

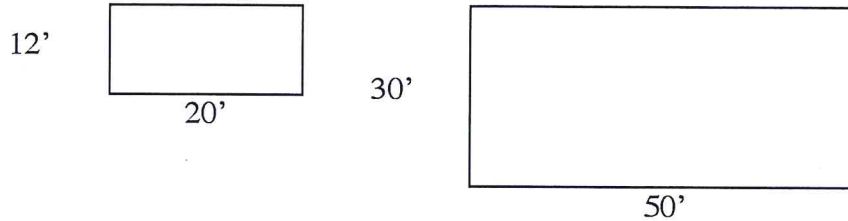
Name: _____

Date: _____

Class: _____

Show all your work and remember your labels!

1. Consider the two rectangles shown below.



a. Are the two rectangles **similar**? How do you know? You need to say more than that they look alike, back up your answer with numbers or calculations.

$\frac{12}{20} = \frac{3}{5}$ and $\frac{30}{50} = \frac{3}{5}$ so the ratios of their sides are the same so **yes**, they are similar.

b. Show your work to calculate both perimeters. What is the **simplified** scale factor or enlargement ratio of the two perimeters?

$12+20+12+20 = 64'$ $\frac{160}{64} = \frac{5}{2}$ new
 $2(30)+2(50) = 160'$ 2 orig Scale Factor: $\frac{5}{2}$

c. Show your work to calculate both areas. What is the **simplified** ratio of the area of the larger rectangle to the area of the smaller rectangle?

new $50(30) = 1500$ $\frac{1500}{240} = \frac{25}{4}$
 orig $20(12) = 240$ Ratio: $\frac{25}{4}$

2. Madeline can decorate 100 cookies in 2 hours. If she continues at this rate, how many cookies can she decorate in $3\frac{1}{2}$ hours? Show your ratio table or calculations.

| | | | | | |
|---------|-----|-----|----|---------------|----------------|
| cookies | 100 | 200 | 50 | 25 | 175 |
| hrs | 2 | 4 | 1 | $\frac{1}{2}$ | $3\frac{1}{2}$ |

$\frac{100 \text{ cookies}}{2 \text{ hr}} = \frac{x}{3\frac{1}{2}}$ $x = 175$

Answer: **175 cookies**

3. During the hour before the football game started, the home team sold m tickets. During the hour after the game started, the home team sold n tickets. All tickets cost \$1.50. Circle the expression which best represents the amount of money collected during the two hours.

- A. $1.5m + n$
- B. $1.5n + m$
- C. $1.5(m + n)$
- D. $1.5(m - n)$

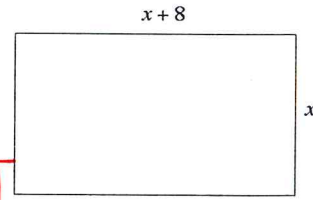
4. Use substitution and show your work to find the perimeter of the rectangle to the right. Show your work (remember those parentheses!)

a. $x = 3?$

$$2(x) + 2(x+8)$$

$$2(3) + 2((3)+8) = 6 + 2(11) = 28$$

$$P = \boxed{28 \text{ units}}$$



b. $x = 12.5?$

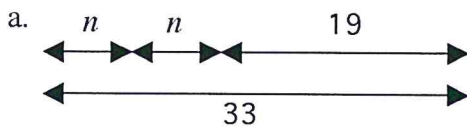
$$2(12.5) + 2((12.5)+8) =$$

$$25 + 2(20.5) =$$

$$25 + 41 = 66$$

$$P = \boxed{66 \text{ units}}$$

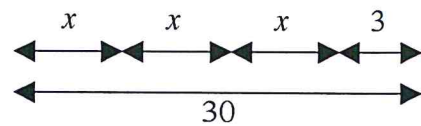
5. Show your work to find the value of the variables in each problem below.



$$2n + 19 = 33$$

$$n = \boxed{7}$$

$$33 - 19 = 14 \text{ so } n = 7$$



$$x = \boxed{9}$$

$$3x + 3 = 30$$

$$30 - 3 = 27$$

$$\text{so } x = 9$$

6. Bill is making a trail mix and he wants to make sure that the ratio of peanuts to raisins to chocolate chips is 5:3:2. Show all of your work to calculate the following:

- a. What percent of the trail mix is made up of raisins?

$$\begin{array}{l} 5+3+2=10 \rightarrow \frac{3}{10} = 30\% \\ P \quad R \quad C \end{array}$$

Percent:

$$\boxed{30\%}$$

- b. If he uses 21 ounces of raisins, how many ounces of trail mix will he have altogether?

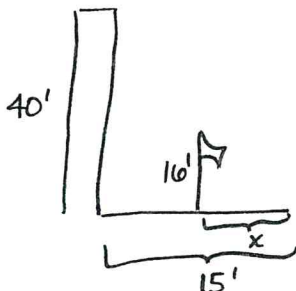
$$\frac{3r}{10 \text{ total}} \xrightarrow{\times 7} \frac{21r}{x \text{ total}}$$

$$x = 70 \text{ oz}$$

Answer:

$$\boxed{70 \text{ oz}}$$

7. A 40' building at a particular time casts a 15' shadow. A 16' flagpole is nearby. What will be the length of the flagpole's shadow? Draw and label a picture and then show your work to get the answer.



$$\begin{array}{l} \text{building } \frac{40}{15} \\ \text{flagpole } \frac{16}{x} \end{array} \xrightarrow{\times 3} \frac{15}{x}$$

$$\boxed{x = 6'}$$

8. Rewrite and evaluate the following expressions for: $x = -4$, $y = 6$, $z = -10$

a. $5y + z = \boxed{20}$
 $5(6) + (-10) = 30 - 10 = 20$

f. $z + x = \boxed{-14}$
 $(-10) + (-4) = -14$

b. $3(6 - z) = \boxed{48}$
 $3(6 - (-10))$
 $3(16) = 48$

g. $z + 2y^2 = \boxed{62}$
 $-10 + 2(6)^2$
 $-10 + 2(36)$
 $-10 + 72$

c. $x - (-y) = \boxed{2}$
 $(-4) - (-6)$
 $-4 + 6 = 2$

h. $\frac{1}{2}y + y = \boxed{9}$
 $\frac{1}{2}(6) + (6) = 3 + 6 = 9$

d. $\frac{y^2}{x - z} = \boxed{6}$
 $\frac{(6)^2}{-4 - (-10)} = \frac{36}{6}$

i. $|y| - |z| = \boxed{-4}$
 $|6| - |-10| = 6 - 10 = -4$

e. $|y + z| = \boxed{4}$
 $|(6) + (-10)| = |-4| = 4$

j. $-|2y - x| = \boxed{-16}$
 $-|2(6) - (-4)| = -|12 + 4| = -|16|$
 $= -16$

9. Simplify the following expressions:

a. $\frac{304}{.011} = \boxed{27,636.\overline{36}}$

$$\begin{array}{r} 27636.\overline{36} \\ \text{011} \overline{) 304000} \\ \underline{22} \\ 84 \\ \underline{77} \\ 70 \\ \underline{66} \\ 40 \\ \underline{33} \\ 7 \end{array}$$

b. $\frac{.0285}{15} = \boxed{.019}$

$$\begin{array}{r} .019 \\ 15 \overline{) .0285} \\ \underline{15} \\ 135 \\ \underline{135} \\ 0 \end{array}$$

10. Corey drew a triangle and the sides are 24cm, 28cm, and 38cm. He wants to draw a new, similar triangle and he wants to use a scale factor of $\frac{3}{4}$.

Will his new triangle be larger or smaller than the original? smaller

The length of each side of the **new** triangle will be what percent of the length of each corresponding side of the **original** triangle?

75%

What will be the lengths of the 3 sides of the new triangle?

$$\frac{3}{4} = \frac{x}{24} \quad x = 18 \text{ cm}$$

(Handwritten annotations: an arrow from 3 to x is labeled $\times 6$, and an arrow from 4 to 24 is labeled $\times 6$)

$$\frac{3}{4} = \frac{x}{28} \quad x = 21 \text{ cm}$$

(Handwritten annotations: an arrow from 3 to x is labeled $\times 7$, and an arrow from 4 to 28 is labeled $\times 7$)

$$\frac{3}{4} = \frac{x}{38} \quad x = 28\frac{1}{2} \text{ cm}$$

(Handwritten annotations: an arrow from 3 to x is labeled $\times 9\frac{1}{2}$, and an arrow from 4 to 38 is labeled $\times 9\frac{1}{2}$)

Side #1 18cm

Side #2 21cm

Side #3 28 $\frac{1}{2}$ cm