Warm Up **10/17/18**

1. Solve: $-3(2x - 5) + x > 4x + 10$

$-6x + 15 + x > 4x + 10$

$-5x + 15 > 4x + 10$

$-4x \quad -4x$

$-9x + 15 > 10$

$-15 \quad -15$

$-9x > -5$

$\frac{-9x}{-9} > \frac{-5}{-9}$

$x < \frac{5}{9}$

2. If $x^2 = 49$ and $y^2 = 81$, find $x + y$

$\sqrt{x^2} = \sqrt{49}$ $\quad \sqrt{y^2} = \sqrt{81}$ $\quad 7 + 9$

$x = 7$ $\quad y = 9$ $\quad 16$

3. If 7 more than three times a number is -17, find the number.

+ MULT. V =

x = the number

$7 + 3v = -17$

$-7 \quad -7$

$\frac{3v}{3} = \frac{-24}{3}$

$v = -8$

Unit Rates & Conversions

Proportional Relationship

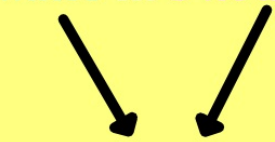
When 1 quantity varies directly
to another quantity

Examples:
-Speed of a car (miles per hour)
-Gas consumed on a trip (gallons per mile)
-Money earned at a job (Dollars per hour)

Rate - a special ratio that compares two quantities measured in different units

Ex.) Ms. Davis drove 75 *miles* in 3 *hours*

$\frac{75 \text{ miles}}{3 \text{ hours}}$



two different units

Unit Rate - a special rate where the denominator is one

The unit rate would be the number of miles per one hour.

$\frac{75 \text{ miles}}{3 \text{ hours}} = \frac{25 \text{ miles}}{1 \text{ hour}}$

25 mph

Write the following as a ***rate*** and a ***unit rate***.

1) What is the speed of a biker who can travel 36 miles in 4 hours?

$\frac{36\text{ mi}}{4\text{ hrs.}} = \frac{9\text{ mi}}{1\text{ hr}}$ 9mph

2) Amy can type 40 words in 2 minutes, what is her speed?

$\frac{40\text{words}}{2\text{ min}} = \frac{20\text{ words}}{1\text{ min}}$ 20 words per min

Write the following as a ***rate*** and a ***unit rate***.

3) What is the unit price if you can buy 8 cans of soda for $3.60?

$$\frac{\$3.60}{8 \text{ cans}} = \frac{\$0.45}{1 \text{ can}}$$

$0.45 per can

Better Buy

To Find: *Compare the unit rates*
to find the lower of the two

Which is better?

4 kiwi for $2.76 or 10 kiwi for $6.50

$0.69 Per Kiwi

$0.65 Per Kiwi

2 pounds of flour for $4.24 or 3 pounds of flour for $6.45

$2.12 per lb.

$2.15 per lb.

Better Buy

Example To Watch

$75.00 for 5 shirts	$126.00 for 8 shirts
Unit Rate:	Unit Rate:
$15 per shirt	$15.75 per shirt

Better Buy:

Savings:

Converting Units

1. Choose unit rate as a conversion factor
2. Divide out common units (What you want to eliminate should go in the denominator)
3. Simplify

Example:

Convert 350 minutes into hours.

$$\frac{350 \text{ minutes}}{1} * \frac{1 \text{ hour}}{60 \text{ minutes}} = 5.83 \text{ hours}$$

$$\frac{350}{60}$$

Converting Units

1. Choose unit rate as a conversion factor
2. Divide out common units (What you want to eliminate should go in the denominator)
3. Simplify

Example:

Convert 15 kilograms to grams.

Which unit rate is correct?

$\frac{1 \text{ kilogram}}{1000 \text{ grams}}$ or $\frac{1000 \text{ grams}}{1 \text{ kilogram}}$

15 kilograms = 15,000 grams

$$15 \text{ kg} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} = 15{,}000$$

Converting Rates

You can convert rates. For example, a speed in miles per hour can be converted to feet per second. Because rates compare measures in two diufferent units, you must multiply by two conversion factors to change both units.

Example

A student ran the 50-yd dash in 5.8 seconds. What is this student's speed in miles per hour? Round your answer to the nearest tenth.

***To solve:* Write the speed as a ratio. Choose conversion factors so that the original units (yards and seconds) divide out, leaving you with the units you want (miles and hours).**

$$\frac{50\ \text{yards}}{5.8\ \text{seconds}} * \frac{3600\ \text{sec}}{1\ \text{hr}} * \frac{1\ \text{mile}}{1760\ \text{yd}} = \frac{17.6}{1}\ \frac{\text{miles}}{\text{hour}}$$

$$\frac{180{,}000}{10{,}208}$$

17.6 mph

Lesson Check

1. *Which is the better buy - 6 muffins for $7.24 or 8 muffins for $9.20?*

$1.21 per muf.

$1.15 per muf.

2. *What is 7 lbs. 4 oz. converted to ounces?*

$7\text{lbs} \cdot \frac{16\text{oz}}{1\text{lbs}} = 112\text{oz}$

112+4

116oz

3. *Which is longer 13 meters or 12 yards?* 1.09361 yd per m

$13\text{m} \cdot \frac{1.09361\text{yd}}{1\text{m}} = 14.2\text{yd}$

4. *A car is traveling at a speed of 55 mi per hr. What is the car's speed in feet per second?* 5280 ft per mi

$\frac{55\text{mi}}{1\text{hr}} \cdot \frac{5280\text{ft}}{1\text{mi}} \cdot \frac{1\text{hr}}{3600\text{sec}} = \frac{290{,}400}{3600}$

$80.\overline{6}$ ft per sec

Exit Ticket

1. Write as a unit rate: 336 miles in 7 hours

2. Which is the better buy?

3 sweatshirts for $58.50

4 sweatshirts for $77.80

3. If $x^2=121$ and $y^2=64$, what is $y - x$?