Do Now

Solve the following proportions. Round to the nearest tenth if necessary.

1) $\frac{3}{x} = \frac{16}{25}$

$16x = 75$

$\frac{16x}{16} = \frac{75}{16}$

$x = 4.7$

2) $\frac{2.5}{10} = \frac{x}{65}$

$10x = 162.5$

$\frac{10x}{10} = \frac{162.5}{10}$

$x = 16.25 = 16.3$

3) A train travels a distance of 250 miles in 1.5 hours. How far will the train have traveled after 5 hours? Round your answer to the nearest tenth of a mile.

$\frac{\text{mi}}{\text{hrs}}$ $\frac{250}{1.5} = \frac{x}{5}$

$1.5x = 1250$

$\frac{1.5x}{1.5} = \frac{1250}{1.5}$

$x = 833.3$ mi

Lesson #25 – Unit Rate vs. Proportions

Recall:

Frank can paint 20 paintings in 8 hours. Find his unit rate in paintings per hour.

$\frac{20 \text{ paintings}}{8 \text{ hrs}} = \frac{2.5 \text{ paintings}}{1 \text{ hr.}}$

We can solve proportional word problems in two different ways: by solving proportions or by solving unit rate.

Example 1) At the store, beef jerky was $73.70 for 5 pounds. If you bought 7 pounds, how much would it cost?

Proportion Method

$\frac{\$}{1 \text{ lbs}}$ $\frac{\$73.70}{5 \text{ lbs}} \times \frac{x}{7 \text{ lbs}}$

$5x = 515.9$

$\frac{5x}{5} = \frac{515.9}{5}$

$\$103.18$

Unit Rate Method

$\frac{\$73.70}{5} = \frac{\$14.74}{1 \text{ lb.}}$

$\$14.74(7) = \$103.18$

Example 2) If Janet can type 20 words in 80 seconds, how many words can she type in 240 seconds?

Prop

$\frac{\text{words}}{\text{Sec}}$ $\frac{20}{80} \times \frac{x}{240}$

$\frac{80x}{80} = \frac{4800}{80}$

$x = 60$ words

Unit rate

$\frac{20 \text{ words}}{80 \text{ Sec}} = 0.25 \frac{\text{words}}{\text{per sec.}}$

$0.25(240) =$ 60 words

Try It!

There are 120 calories in 4 teaspoons of peanut butter. How many calories are in 6 teaspoons of butter?

$\frac{\text{Calories}}{\text{tsp.}}$ $\frac{120}{4} \times \frac{x}{6}$

$\frac{4x}{4} = \frac{720}{4}$

$x = 180$ calories

Now, You Try!

3) Chris had 72 hits in 200 at-bats. At that rate, how many hits will he have in 275 at-bats?

$\frac{72}{200} = \frac{x}{275}$

$200x = 275 \times 72$

$\frac{200x}{200} = \frac{19800}{200}$

$x = 99$

99 hits

4) Julie can walk $\frac{3}{4}$ of a kilometer in $\frac{5}{6}$ of an hour.

A) Find the unit rate, in kilometers per hour.

$\frac{\text{Km}}{\text{hr}}$ $\frac{\frac{3}{4} \text{ km}}{\frac{5}{6} \text{ hr}}$ $\frac{3}{4} \div \frac{5}{6}$

$\frac{3}{4} \cdot \frac{6}{5} = \frac{18}{20} =$ $\frac{9}{10}$ km per hour

B) How long can Julie walk after 3 hours?

$\frac{9}{10} \cdot \frac{3}{1} = \frac{27}{10} =$ $2\frac{7}{10}$ km

5) Tony sells a 26 ounce jar of pasta sauce for $4.99. Stella sells a 32 ounce jar of pasta sauce that costs $5.79. Which is the better buy? Show all work and explain.

Tony

$\frac{\$4.99}{26} = \frac{\$0.19}{1}$ unit rate

Stella

$\frac{\$5.79}{32} = \frac{\$0.18}{1}$ unit rate

Stella's has the lower unit price.

6) Write a ratio that is equivalent to 15 to 25. 30 to 50

#5-7: A soccer team finishes the regular season with a record of 14 wins to 5 losses.

Write the ratio of:

5) wins to losses: 14 to 5

6) Losses to games played: 5 to 19

7) Losses to wins: 5 to 14

#8-9: Determine if the following is a **rate** or a **unit rate**.

8) 25 miles per hour	9) $15 for every $\frac{1}{2}$ hour
unit rate	rate

#10-11: Define the following. LOOK BACK IN YOUR NOTES IF YOU DON'T REMEMBER.

10) A **ratio** is a comparison of two quantities.

11) A **proportion** is an equation that shows two equal ratios.

12) What is the **difference** between a rate and a unit rate? a unit rate is a rate out of one and a rate compares quantites of different units.