Unit: Ratios and Proportions | Name: _____

Lesson 1: Ratios and Unit Rates | Hour: 4th

Ratios

What is a **ratio**? Comparing two numbers where the order is important.

What is an **equivalent ratio**? Two or more ratios that have the same value. (Think equivalent fractions)

Three Ways to Write a Ratio

1. a "to" b 2. a:b 3. $\frac{a}{b}$

Write the ratio in simplest form. Then write the ratio in two other ways.

1. 8 *to* 6 — 4 to 3, 4:3, $\frac{4}{3}$

2. 39:13 — 3 to 1, 3:1, $\frac{3}{1}$

3. $\frac{7}{28}$ — 1 to 4, 1:4, $\frac{1}{4}$

Write a ratio for each of the following:

4. A basketball player shoots a basketball 34 times, 16 of those shots were successful.

34 − 16 = 18 missed shots

a. Number of misses to total number of shots: $\frac{18}{34} = \frac{9}{17}$

b. Number of successful shots to total number of shots: $\frac{16}{34} = \frac{8}{17}$

c. Number of successful shots to misses: $\frac{16}{18} = \frac{8}{9}$

5. An archer shoots 60 arrows at a target. The arrow hits the scoring area 44 times. What is the number of hits to the number of misses?

60 − 44 = 16 missed shots

$\frac{44}{16} = \frac{11}{4}$

Unit Rate

Unit Rate: When the denominator is 1.

"____ per one ____"

Find the unit rate:

1. You host a party for 12 people. The food and drinks for the party cost $66. What is the cost per person?

$\frac{\$66}{12 \text{ people}} = \frac{\$X}{1 \text{ person}}$ ⇒ $5.50 per one person

2. A jet flies 540 miles in 3 hours. How many miles per hour?

$\frac{540 \text{ miles}}{3 \text{ hrs.}} = \frac{X \text{ Miles}}{1 \text{ hr.}}$ ⇒ 180 Miles per one hour

3. $\frac{320 \text{ newsletters}}{4 \text{ people}} =$

$\frac{320 \text{ newsl.}}{4 \text{ people}} = \frac{X \text{ newsl}}{1 \text{ person}}$ ⇒ 80 newsletters per one person

4. $\frac{600{,}000 \text{ miles}}{24 \text{ hours}} = \frac{600{,}000 \text{ Miles}}{24 \text{ hrs}} = \frac{X \text{ miles}}{1 \text{ hour}}$ ⇒ 25,000 miles per hour

Unit Rate with Complex Fractions

Complex Fraction: When the numerator, the denominator or both are a fraction.

1. $\frac{\frac{5}{8}}{\frac{4}{1}}$

$\frac{5}{8} * \frac{1}{4} = \frac{5}{32}$

2. $\frac{20}{\frac{4}{5}}$

$\frac{20}{1} * \frac{5}{4} = 25$

3. $\frac{\frac{3}{14}}{\frac{13}{49}}$

$\frac{3}{14} * \frac{49}{13} = \frac{21}{26}$

Write the complex fraction as a unit rate:

1. $\frac{\frac{1}{4}}{\frac{1}{10}}$

$\frac{1}{4} * \frac{10}{1} = \frac{5}{2} = \frac{2.5}{1}$

2. $\frac{\frac{9}{16}}{\frac{3}{8}}$

$\frac{9}{16} * \frac{8}{3} = \frac{3}{2} = \frac{1.5}{1}$

3. $\frac{\frac{5}{7}}{\frac{5}{14}}$

$\frac{5}{7} * \frac{14}{5} = \frac{2}{1}$