Ratios and Unit Rates

What is a Ratio?

Ratio = comparison of 2 ___things___

<u>Writing Ratios</u>: A ratio can be written 3 ways.

<u>Example:</u> A bowl of fruit contains <u>8 oranges</u> and <u>5 lemons</u>. What is the ratio of oranges to lemons?

8:5　　　8 to 5　　　$\frac{8}{5}$

Writing Ratios

A group of students had a choice of either hamburgers or pizza for lunch. There were <u>12 students</u> - <u>five chose pizza</u> and <u>seven chose hamburgers</u>.

What is the ratio of pizza to hamburgers?

$5:7 \ , 5 \ to \ 7, \ \frac{5}{7}$

What is the ratio of hamburgers to pizza?

$7 \ to \ 5$

What is the ratio of pizza to students?

$\frac{5}{12}$

Writing Ratios

In basketball you make 15 out of 25 free throws. Show the ratio of free throws made to free throws taken 4 different ways.

$15:25 \qquad 15 \ to \ 25$

$3 \ to \ 5 \qquad \frac{15}{25}$

Equivalent Ratios

Match the equivalent ratios. Not all cards have a match.

| 1:10 | 6:60 |

9:12

6 to 8

$\frac{3}{4}$

$\frac{5}{2}$

$\frac{10}{4}$

ANSWER

$\frac{5}{6}$

10:12

$\frac{10}{5}$

1 to 5

3:15

Rates

Rate = a ratio that compares 2 quantities measured in ___different___ units.

<u>Example:</u> $\begin{array}{l} 75 \ miles \div 3 \\ 3 \ hours \div 3 \end{array}$

Unit Rates

Unit rate = a ratio that compares 2 quantities where one of the quantities is 1

To change rate to unit rate, _divide_ the numerator and denominator by the ___denominator___.

Example: $\frac{75 \text{ miles} \div 3}{3 \text{ hours} \div 3}$ Unit rate = $\frac{25 \text{ miles}}{1 \text{ hour}}$

Find the Unit Rate

$\frac{36 \text{ miles} \div 4}{4 \text{ hours} \div 4}$ $\frac{9 \text{ miles}}{1 \text{ hour}}$

$\frac{1 \text{ tablespoon} \div 2}{2 \text{ quarts} \div 2}$ $\frac{\frac{1}{2} \text{ TBSP}}{1 \text{ Quart}}$

Using Unit Rates

Find the price per ounce for each box of cereal to determine which is the better deal.

18 oz box
$3.96

$\frac{3.96}{18 \text{ oz.}}$

$\frac{.22}{1 \text{ oz.}}$

24 oz box
$4.80

$\frac{4.80}{24 \text{ oz.}}$

$\frac{.20}{1 \text{ oz.}}$

Using Unit Rates

If John can paint 1/8 of a wall in 11 minutes, how long will it take him to paint a room with 3 walls?

$\frac{\frac{1}{8} \text{ wall} \cdot 24}{11 \text{ min} \cdot 24}$ $\frac{3 \text{ walls}}{264 \text{ min}}$

Using Unit Rates

A 3-pound package of ground beef is $7.80. A ½-pound package is $1.28. What is the difference in the cost per pound between the larger and smaller packages of beef?

$\frac{7.80 \div 3}{3 \text{ lb.} \div 3}$ $\frac{1.28 \times 2}{\frac{1}{2} \text{ lb.} \times 2}$ $= \frac{2.56}{1 \text{ lb}}$

$\frac{2.60}{1 \text{ lb}}$

Warm up $^{11}/_{27}$:
Find the solution set:

$-4 \geq 4(-x+2)$
$\frac{-4 \geq -4x+8}{-8 \qquad -8}$
$\frac{-12 \geq -4x}{-4 \qquad -4}$
$3 \leq x$

$x \geq 3$

$-4(x+20) = 44$
$-4x - 80 = 44$
$\underline{+80 \quad +80}$
$\frac{-4x = 124}{-4 \quad -4}$
$x = -31$

$$14 + \frac{y}{-7} = 19$$
$$-14 \qquad\qquad -14$$
$$\frac{-7}{1}\left(\frac{y}{-7}\right) = (5)(-7)$$
$$y = -35$$

$$-1.3x - 8.7 = -.8x - 4.2$$
$$+8.7 \qquad\qquad +8.7$$
$$-1.3x = -.8x + 4.5$$
$$+.8x \qquad +.8x$$
$$\frac{-.5x}{-.5} = \frac{4.5}{-.5}$$
$$x = {}^-9$$

$$3(x-8) \leq {}^-93$$

$$4 - x > 8.6$$
$$-4 \qquad -4.0$$
$$\frac{-x}{-1} > \frac{4.6}{-1}$$
$$x < -4.6$$

Attachments

mental math division.ppt