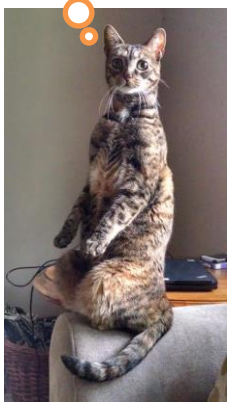
Name: _____ Date: _____

Equivalent Ratios

How can we tell if two ratios are equivalent?



Method 1: Compare the Unit Rates

$$\frac{10 \text{ prints}}{\$2} \overset{\div 2}{=} \frac{5 \text{ prints}}{\$1} \quad \text{and} \quad \frac{30 \text{ prints}}{\$6} \overset{\div 6}{=} \frac{5 \text{ prints}}{\$1}$$

Since the rates have the same unit rate, they are equivalent ratios.

Examples

Determine if each pair of rates is equivalent. Explain your reasoning.

7.50
3 | 22.50
-21
15

1. 20 miles in 5 hours; 45 miles in 9 hours

$\frac{20 \text{ mi}}{5 \text{ h}} = 4 \text{ mph}$ $\frac{45 \text{ mi}}{9 \text{ h}} = 5 \text{ mph}$

No, they are not equivalent because their unit rates are different!

2. 3 T-shirts for $22.50; 5 T-shirts for $37.50

$\frac{\$22.50}{3 \text{ T}} = \$7.50/\text{T-shirt}$

$\frac{\$37.50}{5 \text{ T}} = \$7.50/\text{T-shirt}$

They are equivalent because they have the same unit rate of $7.50 per T-shirt.

3. Felisa read the first 60 pages of a book in 3 days. She read the last 90 pages in 6 days. Are these reading rates equivalent? Explain your reasoning.

$\frac{60 \text{ pg}}{3 \text{ days}} = 20 \text{ pgs/day}$ $\frac{90 \text{ pgs}}{6 \text{ days}} = 15 \text{ pgs/day}$

Not equivalent!

Got It? Do these problems to find out.

Determine if each pair of rates is equivalent. Explain your reasoning.

a. 36 T-shirts in 3 boxes; 60 T-shirts in 6 boxes

b. 42 flowers in 7 vases; 54 flowers in 9 vases

a. No; Since the unit rates $\frac{12 \text{ T-shirts}}{1 \text{ box}}$ and $\frac{10 \text{ T-shirts}}{1 \text{ box}}$ are not the same, the rates are not equivalent. (Show your work.)

b. Yes; Since both unit rates are, $\frac{6 \text{ flowers}}{1 \text{ vase}}$, the rates are equivalent.

Got It? Do these problems to find out.

c. Marcia made 10 bracelets for 5 friends. Jen made 12 bracelets for 4 friends. Are these rates equivalent? Explain your reasoning.

d. Club A raised $168 by washing 42 cars. Club B raised $152 by washing 38 cars. Are these fundraising rates equivalent? Explain your reasoning.

(c) $M = \frac{10b}{5f} = 2$ bracelets per friend

$J = \frac{12b}{4f} = 3$ bracelets per friend

Not equivalent

(d) Club A $= \frac{\$168}{42} = \$4$ per car

Club B $= \frac{\$152}{38} = \$4$ per car

The fundraising rates are equivalent because their unit rates are the same!

Method 2: Use Equivalent Fractions and/or Simplest Form

If a unit rate is not easily found, use equivalent fractions to decide whether the ratios or rates are equivalent.

Equivalent ratios will have the same simplest form!

Examples

Determine if the pair of ratios or rates is equivalent. Explain your reasoning.

4. 3 free throws made out of 7 attempts; 9 free throws made out of 14 attempts

$\frac{3}{7} \overset{\times 3}{\neq} \frac{9}{14}$ ($\times 2$)

Not equivalent because their simplest forms are not the same!

5. Selena is comparing the cost of two packages of DVDs. A package of 6 DVDs costs $90 and a package of 3 DVDs costs $45. Are the rates equivalent? Explain your reasoning.

$\frac{6 \text{ DVD} \div 6 \div 2}{\$90 \div 6 \div 3} \quad \frac{3 \text{ DVD} \div 3}{\$45 \div 3}$

$= \frac{1 \text{ DVD}}{\$15} = \frac{1 \text{ DVD}}{\$15}$

They are equivalent because they have the same simplest form!

Got It? Do this problem to find out.

e. Mrs. Jeffries has 12 girls out of 16 students on the Student Council. The Earth Day Committee has 4 girls out of 8 students. Are the ratios equivalent? Explain your reasoning.

e. **No; since $\frac{12 \text{ girls}}{16 \text{ students}} \neq \frac{4 \text{ girls}}{8 \text{ students}}$, the ratios are not equivalent.**