

Notes: Ratios, Rates, & Proportions
Created for you by Ms. Nhetsoubank!

Definitions:

1. **Ratio:** A comparison of two numbers by division. A ratio can be written in three ways:

- as a fraction $\frac{17}{25}$,
- with a colon 17:25, or
- with words 17 to 25.

2. **Rate:** when the quantities in a ratio have **different units.**

Example: $\frac{160 \text{ miles}}{2 \text{ hours}}$

3. **Unit rate:** when a rate has a **denominator of 1.** To find a unit rate, divide the numerator by the denominator.

Example: $\frac{160 \text{ miles}}{2 \text{ hours}}$ is the same as $\frac{80 \text{ miles}}{1 \text{ hour}}$ or 80 miles **per** hour.

4. **Proportion:** An equation that shows that **two ratios** are **equivalent** (equal).

Example: $\frac{16}{20} = \frac{4}{5}$

$$\frac{16}{20} = \frac{4}{5}$$

In a proportion, the **cross products** are equal.

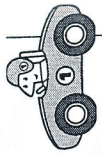
5. **Complex Fraction:** A fraction that has a fraction in its numerator, denominator, or both.

Examples:

1. $\frac{1}{2}$ is the same as $\frac{1}{2} \div 10$	2. $\frac{12}{5}$ is the same as $12 \div \frac{2}{5}$	3. $\frac{3}{4}$ is the same as $\frac{2}{3} \div \frac{4}{5}$
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Name: Key
Math 7H - Nov. 27

Glue on page 30



1. Do these ratios form a proportion? Explain.

$7/12 = 35/60$ NO, b/c their cross products are not equal.
 $7/12$ and $35/60$
 "bottoms up"
 cross products
 $35 \neq 48$

2. Solve for x.

cross multiply
 solve for x
 $\frac{8}{2x-5} = \frac{2}{10}$
 $2(2x-5) = 8(10)$
 $4x - 10 = 80$
 $4x = 90$
 $x = 22.5$
 or 22 1/2

3. Three gallons of gas cost \$9.45. At this rate, how much would 12 gallons of gas cost?

cost amount = unit rate
 $\frac{9.45}{3 \text{ gal}} = \frac{3.15}{1 \text{ gal}}$
 $3.15(12)$
 $= 37.80$ for 12 gallons



4. Which is the best buy? C cheaper

Product	Amount	Price	Unit Price
A Egglard's Best	1 Dozen 12 eggs	\$3.79	\$0.32
B Stop and Shop's Brand	0.5 Dozen 6 eggs	\$1.29	\$0.22
C Stop and Shop's Brand	1.5 Dozen 18 eggs	\$1.99	\$0.11

CA
 cost amount = unit rate
 $\frac{3.79}{12} = 0.32$
 B
 $\frac{1.29}{6} = 0.22$
 C
 $\frac{1.99}{18} = 0.11$

HOMEWORK

Use pages 51-53 to show your work.

32-34

1. Translate the following sentence into an algebraic equation. Then solve the equation.

Five more than the product of a number and 3 is negative twelve.

2. At Faith's Farm, 70 ounces of dried cranberries costs \$5.60. At Eneida's Farm, 25 ounces of dried cranberries costs \$2.25. Which farm has the best price? Explain your answer.



3. Grant spent \$524.00 for hockey tickets. This cost included a \$8.20 service fee for the order, and the 4 hockey tickets. What is the cost of each ticket?

Solve for each proportion.

4.	$\frac{x+4}{3} = \frac{7}{2}$	5.	$\frac{5n+1}{8} = \frac{1}{2}$
6.	$\frac{3x-2}{8} = \frac{5}{4}$	7.	$\frac{2m+3}{6} = \frac{m-9}{8}$

8. Jaidan hikes $\frac{1}{2}$ mile every $\frac{1}{4}$ hour. Max hikes $\frac{1}{3}$ mile every $\frac{1}{6}$ hour. How far do they hike in 2 hours?



9. Graph the inequality: $-6 < x \leq 3$. Then state the solution set.

10. Solve for x:
 $\frac{2}{5}x + \frac{1}{6} > \frac{1}{2}x$