

5-1B Rates and Unit Rates

11-9-15

6th grade math 7

5-1C Proportional and Nonproportional Relationships

Ratio: a comparison of two quantities by division $\frac{2}{4}$ 2:4 2 to 4 *Must reduce

Rate: a ratio of two quantities with different units $\frac{4 \text{ miles}}{2 \text{ hours}} = \frac{2 \text{ miles}}{1 \text{ hour}}$ 2 miles per hour

Unit Rate: a rate that has been reduced to a denominator of one \nearrow "per" means divide

Proportion: an equation stating two ratios or rates are equivalent $\frac{2}{4} = \frac{1}{2}$
* Solve using cross products or heart method

Proportional: when two or more rates or ratios are equal

Nonproportional: when two or more rates or ratios are not equal

Ex. 1 Find each unit rate. Round to the nearest hundredth.

* Denominator of 1!

A) 400 miles on 14 gallons of gasoline

$$\frac{400 \text{ mi} \div 14}{14 \text{ gal} \div 14} = \frac{28.57 \text{ mi}}{1 \text{ gal}}$$

28.57 miles per gallon

B) 125 students in 5 classes

$$\frac{125 \text{ students} \div 5}{5 \text{ classes} \div 5} = \frac{25 \text{ students}}{1 \text{ class}}$$

25 students per class

Ex. 2 A farmers market sells 8 ears of sweet corn for \$3.50. At this same rate, how much will it cost to buy 28 ears of sweet corn?

* Find unit rate first.
(cost per one ear of corn)
\$ money always goes on top

$$\frac{\$3.50}{8 \text{ ears}} = \frac{\$0.4375}{1 \text{ ear}}$$

$$28 \text{ ears} = 28 \cdot 0.4375 =$$

\$12.25 for 28 ears of sweet corn

Ex. 3 Determine whether each set of numbers is proportional. * Find unit rates to compare.

(denominator is one)

Time (s)	1	2	3	4
Distance (m)	24	48	72	96

meters per second

$$\frac{24}{1} \quad \frac{48}{2} = \frac{24}{1} \quad \frac{72}{3} = \frac{24}{1} \quad \frac{96}{4} = \frac{24}{1}$$

Yes, the set of numbers are proportional because all rates are 24 meters per second.

Baseballs (#)	1	2	3	4
Cost (\$)	2	3	4	5

cost per baseball

$$\frac{2}{1} \quad \frac{3}{2} = \frac{1.5}{1} \quad \frac{4}{3} = \frac{1.\bar{3}}{1} \quad \frac{5}{4} = 1.25$$

No, the set of numbers are not proportional because the rates are not equal.

homework: 5-1B Homework Practice, 5-1C Skills Practice