

MAT 0018

Rate, Unit Rate & Unit Price Supplement

We have seen how a ratio is the comparison of two LIKE quantities, so therefore the units on a ratio always cancel (because they are the same or can be made the same).

A **RATE** is the comparison of two UNLIKE quantities. Because the units in a rate are different and can NOT be made the same, they DO NOT CANCEL. After reducing the numbers if possible, we must remember to include the units on a rate.

Example: Write the rate as a fraction in simplest form:

24 commercials every 90 minutes

$$\frac{24 \text{ commercials}}{90 \text{ minutes}} = \frac{4 \text{ commercials}}{15 \text{ minutes}}$$

A **UNIT RATE** is a rate with a denominator of 1. We usually use the word "PER" (a division keyword) to denote unit rates. For example, saying that the speed limit is 70 miles per hour means that the fastest the automobile should go is 70 miles in 1 hour. Since per is a division keyword, we use division to find unit rate.

Examples: Find the unit rate.

325 failed hard drives made during a 25 day period

$$\frac{325}{25} = \frac{13}{1} = 13 \text{ failed hard drives per day}$$

348 miles travelled on a 20 gallon tank of gas

$$\frac{348}{20} = 17.4 \text{ miles per gallon}$$

One of the most common unit rates that we use is called unit price. The UNIT PRICE is a unit rate that denotes "money or cost per item".

Example: Find the unit price rounded to the nearest cent.

A 12oz. box of cereal for \$3.30.

$$\frac{3.30}{12} = 0.275$$

The unit price is approximately 28¢ per ounce.

Example: Find the unit price of each product to three decimal places and determine which one is the better buy.

Soda: A: \$0.89 for 12 ounces OR B: \$1.09 for 16 ounces

A: \$0.89 for 12 ounces

$$\frac{0.89}{12} \approx \$0.074/\text{ounce}$$

B: \$1.10 for 16 ounces

$$\frac{1.10}{16} \approx \$0.069/\text{ounce}$$

Soda B is the better buy.