

Chapter 7: Ratios, Rates, and Proportions

CH 7.2 - Rates

Rate:

- The **RATIO** of two **MEASUREMENTS** with two different **UNITS**
- Can be expressed as a **FRACTION** that includes the two different units

Ex. $\frac{200\text{km}}{3\text{hrs.}} \rightarrow 200\text{km}/3\text{hrs}$ $\frac{\$83}{4\text{hrs.}} \rightarrow \$83/4\text{hrs.}$

Unit Rate:

- A rate in which the **SECOND** term is a single unit of MEASURE, often 1

Ex. $\frac{100\text{km}}{1\text{hr.}} \rightarrow 100\text{km}/\text{hr}$ $\frac{\$25}{1\text{hr}} \rightarrow \$25/\text{hr}$

First term (points to 100km) *Second term* (points to 1hr.) *makes a rate that is easier to use.*

How to calculate a unit rate

$\frac{140\text{km}}{3\text{hrs}} \div \rightarrow 140\text{km} \div 3\text{hrs} = \frac{46.67\text{km}}{1\text{hr.}}$ or 46.67km/hr

** divide top by bottom.*

Problem: Tyler rides his mountain bike on a 40km trail. It takes him 2 hours and 30 minutes to complete the whole trail. What unit rate represents his average speed?

$\frac{40\text{km}}{2.5\text{hrs.}} \div \rightarrow 40\text{km} \div 2.5\text{hrs} = \frac{16\text{km}}{1\text{hr}}$ or 16km/hr.

$\frac{30\text{min}}{60\text{min}} = 0.5\text{hrs.}$

Name:

Math 8

Date:

Unit Price:

- A special unit RATE used when shopping
- Often shown per LITER, KILOGRAM, or per ITEM

Ex. $\frac{\$20}{1L}$ $\frac{\$5.99}{1kg}$

How to calculate a unit price

- \$26 for 8g of strawberries.

$$\frac{\$26}{8g} = \$26 \div 8g \rightarrow \$3.25/g$$

- \$160 for 60L of fuel.

$$\frac{\$160}{60L} \rightarrow \$160 \div 60L = \$2.67/L$$

In some cases, one unit of measure may be something other than 1. Such as \$/100g.

- \$5.89 for 350g of peanuts. Find \$/100g.

$$\frac{\$5.89}{350g} = \frac{x}{100g} \rightarrow \$5.89 \times 100g = \$589 \div 350g = \$1.68 \rightarrow \$1.68/100g$$

*cross multiply and divide.

Problem: Brittany is buying a smoothie. The store has the following cup sizes.

A. What size is the best according to price?

S M L

$$\frac{\$2.69}{300mL} = \frac{x}{100mL} \rightarrow \$0.897/100mL$$

$$\frac{\$3.79}{450mL} = \frac{x}{100mL} \rightarrow \$0.842/100mL$$

$$\frac{\$5.29}{600mL} = \frac{x}{100mL} \rightarrow \$0.881/100mL$$

Best deal → lowest price per 100mL



B. What else should she consider when choosing a size?

- how much she actually needs.

Practice assignment - page 237 # 1, 2, 3, 5, 6, choose two apply questions