Math 2201 **Date:_____**

8.2 Solving Problems Involving Rates

The focus here is to describe a situation in which a given rate might be used and is most useful. A situation to describe the rate 5¢/min, for example, could be a long distance phone call within Canada.

You will also be expected to determine the reasonableness of rates. If a student was having a party and trying to determine the number of slices of pizza per person, would it matter if the party was for a 3 year old as opposed to a teenager?

Answer questions such as if you are planning a road trip to Las Vegas:

- Is it reasonable to discuss a road trip to Las Vegas in terms of m/s?

No. m/s would be too large.

- What rate(s) could be used to describe this road trip?

km/h or mi/h

- What factors might affect your rate of speed on this trip?

- speed limit
- road conditions
- type of vehicle
- number of stops

- What factors might affect your fuel consumption?

- hills vs. flat terrain
- speed
- weight
- type of vehicle

Example 1:
During a Terry Fox Run, student volunteers distribute 250 mL cups of water to participants as they cross the finish line. Each volunteer has a cooler that can hold 64 L of water. How many cups of water can each volunteer dispense?

$$64\,\text{L} \times \frac{1000\,\text{mL}}{1\,\text{L}} = 64000\,\text{mL}$$

$$\frac{64000\,\text{mL}}{250\,\text{mL}} = 256\ \text{cups}$$

Example 2:
Loose-leaf paper costs $1.49 for 200 sheets or $3.49 for 500 sheets.

(A) What is the least you can pay for 100 sheets?

$$\frac{\$1.49}{200\ \text{sheets}} = \frac{\$0.00745}{\text{sheet}} \times 100\ \text{sheets} = \$0.74$$

$$\frac{\$3.49}{500\ \text{sheets}} = \frac{\$0.00698}{\text{sheet}} \times 100\ \text{sheets} = \boxed{\$0.70}$$

(B) 1600 sheets?

$$\$0.00745/\text{sheet} \times 1600\ \text{sheets} = \$11.92$$

$$\$0.00698/\text{sheet} \times 1600\ \text{sheets} = \$11.17$$

Your turn:

1. Betty earns $463.25 in 5 weeks. How much will she earn in 2 years?

$\frac{\$463.25}{5 \text{ weeks}} = \frac{\$92.65}{\text{week}} \times 52 \text{ weeks} \times 2 = \$9635.60$

2. A 12-bottle case of motor oil costs $41.88. A mechanic needs to order 268 bottles of motor oil. If he can only order by the case, how much money does he spend?

$\frac{268 \text{ bottles}}{12 \frac{\text{bottles}}{\text{case}}} = 22.3 \text{ cases} \sim 23 \text{ cases}$

$23 \text{ cases} \times \frac{\$41.88}{\text{case}} = \$963.24$

Textbook Questions: page 458 - 461 #1 – 13, 15