Section 4.5

TERMINOLOGY 4.5

For each of the following terms, provide 1) a definition in your own words, 2) the formal definition (as provided by your text or instructor), and 3) an example of the term using a drawing or problem. A sample filled-out form is available in the Introduction.

Ratio

Your definition	
Formal definition	
Example	

Rate

Your definition	
Formal definition	
Example	

Unit Rate

Your definition	
Formal definition	
Example	

READING AND SELF-DISCOVERY QUESTIONS 4.5

1. According to your text, what are three different ways you can express a ratio?

   a. 5 to 22 b. 5:22 c. 5/22

2. Can you always express a rate in terms of a fraction? Explain your answer.

   Yes, althought it is a fraction with units. When the denominator is 1, a rate is defined as a unit rate.

3. If you are given a ratio and a rate, both written in fraction form, how can you tell which is the ratio and which is the rate?

   The ratio units have been cancelled out while the rate will have units.

CRITICAL THINKING QUESTIONS 4.5

1. What are at least three unit rates that you encounter regularly? (Hint: Think "_____ per _____".)

   Student answers will vary. Examples include: miles per hour; dollars per ounce; calories per day.

2. Rates and ratios are very useful when comparison shopping. Why is this so?

   Unit rates make it easy to compare between different sized packages.

3. List as many words as you can that indicate you are working with ratios and rates in a word problem.

   Student answers will vary, but should include terms such as:
   Calculate the average storms *per* year; 400 students *and* 15 teachers – teacher/ student ratio; trees *per* household; computers *in each* home, etc.

DEMONSTRATE YOUR UNDERSTANDING 4.5

1. a) What country outside the U.S. do you want to travel to? **Brazil**

   b) What is the monetary exchange rate for this country? (You can find this on-line or in a newspaper.)

   $1 = 1.75 reals (R$)

   c) You need $100 for travel purposes. Convert $100 to the foreign country's currency. Show your work.

$$\frac{1}{1.75} = \frac{100}{x}$$

$$x = 100\ (1.75)$$

$$\boldsymbol{x = 175}$$

This sample answer demonstrates how students should approach and solve the problem.

IDENTIFY AND CORRECT THE ERRORS 4.5

In the second column, identify the error(s) you find in the following worked solution. Describe the error made in the second column. Solve the problem correctly in the third column.

Problem	Describe Error	Correct Process
Write the ratio as a fraction in simplest form: 47 gold pieces to 94 gold pieces	**The student has not reduced the fraction to its simplest form.**	$\frac{47}{94} = \frac{\cancel{47} \times 1}{\cancel{47} \times 2} = \mathbf{\frac{1}{2}}$
Worked Solution *(What is wrong here?)*		
$\mathbf{\frac{47}{94}}$		