Worksheet for sections 7.1 and 7.2

Section 7.1

1. Write these decimal numbers as fractions, and then simplify the fractions:

Decimal	Fraction (exact translation)	Fraction simplified	Prime factors of denominator
.75	75/100	3/4	2 , 2
.5			
.10			
.05			
.125			
.25			

2. a. Notice that all the decimals in #1 were terminating. What did you notice about the denominator of the fractions before simplifying?

   b. What did you notice about the prime factors of the denominator of the fractions after simplifying?

   c. Now read the theorem on page 289.

Section 7.2

3. **Read** pages 301-305 **then do set A, page 306 # 13-14 & 19-22.**
   Notice the **patterns** for changing repeating decimals to fractions.

4. After doing # 19-22, write the following decimal numbers as fractions, then simplify the fractions:

Decimal	Fraction (9s in denominator)	Fraction simplified
.11111**…**	1/9	1/9
.33333**…**	3/9	1/3
.6666**…**		
.7777**…**		
.636363**…**		

5. a. Notice that all the decimals in #4 were repeating. What did you notice about the denominator of the fractions before simplifying ?

   b. What did you notice about the denominator of the fractions after simplifying?

6. Read the theorem on page 304 (and reread the theorem on page 289).

7. **Read Example 7.19 on page 304** for how to **use algebra** to convert a repeating decimal to its fractional form. Convert this infinite repeating decimal 0.5626262**…** to an equivalent fraction.
Do section 7.2 set A # 15 a, b, c.

Also read page 301-302 then do the problems using **Scientific Notation**: section 7.2 Set A # 6-9.

To understand the theorems in sections 7.1 and 7.2 (on pages 289 & 304), it would help to restate these theorems in a series of steps.

1. Rewrite the fraction in its simplest form. (Use the divisibility tests to help in this process.)

2. Write the prime factorization for the denominator of the simplified fraction.

3. a. If the prime factorization for the denominator of the simplified fraction has ONLY factors of 2 and/or 5, then the fraction will convert to a **terminating decimal**.

   b. If the prime factorization for the denominator of the simplified fraction has ANY factors OTHER THAN 2 and/or 5, then the fraction will convert to an **infinite repeating decimal.**

Please explore these web sites for additional practice with these theorems:
http://www.coolmath.com/prealgebra/02-decimals/04-decimals-converting-fraction-to-decimal-01.htm
http://www.coolmath.com/prealgebra/02-decimals/13-decimals-converting-fraction-to-decimal-part2-01.htm
Examples: (Also practice by doing the problems in the homework for section 7.1 set A # 6.)

1. Without dividing to change the following fractions to decimals, tell whether each **would be** a **terminating decimal**, , and then explain how you can determine this using the theorem above.

   a. $\frac{28}{70} =$ ______________ b. $\frac{15}{70} =$ ______________

   a. $\frac{28}{70} = \frac{4}{10} = \frac{2}{5}$ this will be a terminating decimal

   b. $\frac{15}{70} = \frac{3}{14}$ Since the denominator has a factor of 7, it would never be able to be converted to a fraction with a power of ten in the denominator and thus will be NOT be a terminating decimal. It will be an infinite repeating decimal.

   $\left[\frac{3}{14} = 0.214285714\ldots = 0.2\overline{142857}\right]$ Notice: it has 6 digits that repeat infinitely.

2. Tell whether each fraction would be a terminating decimal, without dividing to change the following fractions to decimals. Explain how you can determine if the decimal would terminate.

   a. $\frac{8}{42} = \frac{1}{6}$ The prime factors of the denominator are 2 and 3; the 3 indicates the decimal will be an infinite repeating decimal. $\frac{1}{6} = 0.16666... = 0.1\overline{6}$

   b. $\frac{7}{350} = \frac{1}{50}$ The prime factors of the denominator are 2, 5 and 5, which indicates this fraction will have a terminating decimal. $\frac{1}{50} = \frac{2}{100} = 0.02$