**FACTORS AND MULTIPLES OF WHOLE NUMBERS**

***Introduction:***

Sieve of Eratosthenes activity (separate handout)

***Factors Trees:***

Write the number 4280 as a product of two factors.

 4280

 214 20

* Both chosen numbers are composite so factor again.
* Continue the process until we cannot list any more factors.

The prime factors of 4280 are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The prime factorization of 4280 is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

***FINDING PRIME FACTORS WITH REPEATED DIVISION:***

Find the prime factors of 4280 by repeatedly dividing the number by prime factors.

4280 ÷ \_\_\_\_\_\_ = \_\_\_\_\_\_\_

Not surprisingly we obtain the same result:

Prime factorization of 4280: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***THE GREATEST COMMON FACTOR:***

The greatest common factor, or GCF, is the greatest factor that divides two numbers. There are many different ways to find the GCF of two numbers:

**Method #1:**

1. List the prime factors of each number. (prime factorization)
2. Circle the factors common to both sets.
3. Multiply these factors. If there are no common prime factors, the GCF is 1.

Example 1: What is the greatest common factor of 18 and 24:



Example 2: What is the greatest common factor of 120 and 316?

**Method #2**:

1. List all factors of the larger number.

Factors of 316: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Start with the largest factor of see if it is also a factor of the other number (120). Repeat the process until you find the number that goes into both.

Example 3: What is the greatest common factor of 138 and 198?

**Method #3**:

1. List all factors of each number (be systematic).
2. Choose the largest number that is common to both.

***THE LEAST COMMON MULTIPLE:***

Determine the least common multiple of 8, 12, and 16:

(List the multiples of each number until the same number appears in all of the lists.)

8 →

12 →

16 →

Therefore the least common multiple of 8, 12 and 16 is \_\_\_\_\_\_\_\_\_\_.

***Alternate Method:***

Write out the prime factorization of each number.

Choose the greatest power of each prime factor in any list.

Find the product of these results.

Example:

8 →

12 →

16 →

***PUTTING IT ALL TOGETHER:***

Complete a factor tree for 750 and 175.

1. Determine the greatest common factor.
2. Determine the lowest common multiple.

PRACTICE QUESTIONS:

Page 140: 3 (b), 4 (d), 5 (d), 6 (b), 8 (e), 9 (b), 10 (c), 11 (b), 12