Prime Numbers and GCF

A natural number that has exactly two different factors (1 and itself) is called a _____.

A natural number that has factors other than 1 and itself is called a _____.

#	Prime, composite, or neither?
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Here's a short list of prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, …

Notes:

___ is the only natural # that is neither prime nor composite.

Natural numbers bigger than 1 are either prime or composite, but not both.

Is a # prime?

1. _____ # by larger and larger _____ (2, 3, 5, 7, …)
2. If # is divisible by a prime, then # is composite.
3. If not, continue dividing by primes until _____, at which point you can stop and call your # a prime.

Ex 1.

Is 119 prime or composite?

Ex 2.
Is 157 prime or composite?

A product written with prime factors only is called a _____.

We can write the prime factorization for any composite number. For example, the prime factorization of 20 is $2 \cdot 2 \cdot 5$, or using exponential form $2^2 \cdot 5$.

We'll use "factor trees" to help find prime factorization of numbers.

Ex 3.
Use a factor tree to find the prime factorization of 45. Write the answer in exponential form.

To list all factors of a number, _____ by _____ until you have all the factors.

Ex 4.
List all factors of 60.

The greatest number that divides all given numbers with no remainder is called the _____.

ex: The GCF of 32, 40, and 24 is 8. Why? Since 32, 40, and 24 are divisible by 8, and 8 is the greatest such number.

Ex 5.
Find the GCF of 36 and 54 by listing factors.

How to find GCF using prime factorization
1. Write _____ of each # in exponential form.
2. Make factorization that contains prime #'s common to all above factorizations, each raised to least of its exponents.
3. Multiply to get GCF.

(Note: if no common prime factors, then GCF is 1)

Ex 6.
Find the GCF of 84 and 48 using prime factorization.

Ex 7.
Find the GCF of 60 and 77 using prime factorization.

Ex 8.

A rectangular kitchen floor measures 18 feet long by 16 feet wide. What is the largest-size square tile that can be used to cover the floor without cutting or overlapping the tiles?

GCF of Monomials

Ex 9.

Find the GCF of $20x$ and $32x^3$.

Ex 10.

Find the GCF of $24x^5$, $16x^4$, and $48x^3$.