6.1

Friday, August 24, 2012
10:46 AM

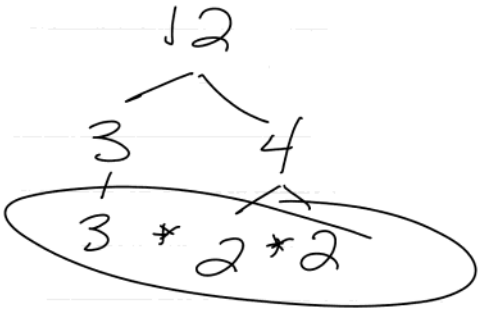
Prime Factorization

Prime number - a natural number that cannot be written as the product of two other integers.

ex) 12 is NOT prime since $12 = 3 \cdot 4$ or $12 = 2 \cdot 6$
5 is prime since no two integers multiplied together equal 5 (except $5 \cdot 1$)

Prime factorization - write a number as the product of all primes.

ex) the prime factorization of 6 is what about 12?



The Greatest Common Factor

The biggest number that is a factor of two numbers

ex $12 = 2 \cdot 2 \cdot 3$
$210 = 2 \cdot 3 \cdot 5 \cdot 7$
They both have a 2 and a 3 so the GCF of 12 and 210 is $2 \cdot 3 = 6$

GCF is 6

GCF of Monomials

To find prime factorization of monomial
1. find pr. fact. of the coefficient
2. write out variables

ex $15x^2y^3 \rightarrow$ 15 $\rightarrow$ 3 * 5 x x y y y

To find GCF of monomials
1. find pr. fact. of each
2. List each common factor
3. find the product of these factors

ex $12x^2y^3 =$ 2 2 3 x y y y
$16xy^2 =$ 2 2 2 2 x y y

12: 3 4; 3: 3; 4: 2 2
16: 4 4; 4: 2 2; 2 2

2 * 2 * x * y * y
$= 4xy^2$

Factoring Out the GCF from a Polynomial

If I have a GCF in a polynomial I can factor it out, this is distributive property in reverse.

ex) $4x(x+2) = 4x^2+8x$

ex) To take it back out or factor it out.

$4x^2+8x$

1. find GCF of $4x^2$ and $8x$

$4x^2 = 2 \cdot 2 \cdot x \cdot x$

$8x = 2 \cdot 2 \cdot x$

GCF = $4x$

2. Rewrite polynomial with GCF in it

$4x^2+8x = 4x \cdot x + 4x \cdot 2$

3. Take GCF out

$4x(x+2)$

Try one

$15x^2+6x = ?$

Factoring Out a Negative and a Binomial

To factor out a negative, change all the signs

ex $-x^2-4x+2$ factor out a negative.

ex factor $-2x-2$

$-(2x+2\cdot1)$ GCF = 2

$-2(x+1)$

To factor out a binomial, just like with a monomial

ex $(2x)x-(2x)3 = 2x(x-3)$

$(2x+1)\cdot x-(2x+1)\cdot 3 = (2x+1)(x-3)$

Factoring by Grouping

1. Group terms so that first two terms have a common factor & last two terms have common factor
2. factor out from each group
3. factor out remaining common binomial. If there is no common binomial, regroup, repeat 2 and 3.

ex $7x^2+2y+7xy+2x$

$7x^2+2x+7xy+2y$

GCF = x GCF = y

2. $x(7x+2)+y(7x+2)$

$(7x+c)$