

This is one of the most important topics we will cover. Factoring will be a part of your algebra studies all through this course, Trig, Math Analysis, and Calculus. There are several different ways to factor:

- 1- Use the GCF
- 2- Difference of Squares
- 3- Trinomials
- 4- Sums/differences of cubes

The first 3 were taught in Algebra I so should just be a review.

Let's review what you know about factors of numbers:

If I asked you for the factors of 24, you might say _____ because each of these pairs gives 24 when multiplied together. This is what we will be looking for in the factoring problems we do today—what did we multiply to get the original problem?

Let's review multiplying a monomial by a polynomial.

$$6(3x + 4) = \underline{\hspace{2cm}}$$

$$x^2(2x - 7) = \underline{\hspace{2cm}}$$

What we are going to do is go in the opposite direction.

ex. Factor $18x + 24$

1st ask yourself what number divides into 18 and 24 (choose the largest number possible); that number is ____

Write this number outside the parenthesis.

Now divide into each of the terms of the problem and write the result in the parenthesis.

You have factored the problem.

If you want to check your answer, multiply it back to the original problem

Ex. Factor $35x^2 - 7x + 14$

Try these.

Factor:

- 1) $27y - 12$
- 2) $45x^2 - 15x + 24$
- 3) $7xy + 14x + 21y$

Now lets look at these :

EX. Factor $5x^2 - 4x$

Notice that there is no number that divides inot 5 and 4. So you can't divide by any number. However, look at each term—they both contain an "x". Therefore, you can take an "x" out of each term. Put this "x" in front of the parenthesis.

Now "subtract" the exponents in each term. Put the result inside the parenthesis

Ex. Factor $14x^2y^3 - 4xy^4 + 12x^4y^5$ This time you can divide first

Now if you look at the variables, you should see that each one has an x. So take it out and put it with the number from above.

But, look again—each term also contains y ; in fact, each term contains at least y^3 so take this out also.

Multiply if you want to check your answer.

Try these

- 1) $x^4y - 10xy^3 + 3xy$
- 2) $25xyz - 35xy + 20xz$