STEPS TO FACTORING

1. Check for Greatest Common Factor (GCF).

2. Count the terms-

       2 Terms   **3 Terms**

       Difference
     of Squares   **FOIL**   **Perfect Square**
        (DOS)   **FOIL**

                                Decomposition
                                   FOIL
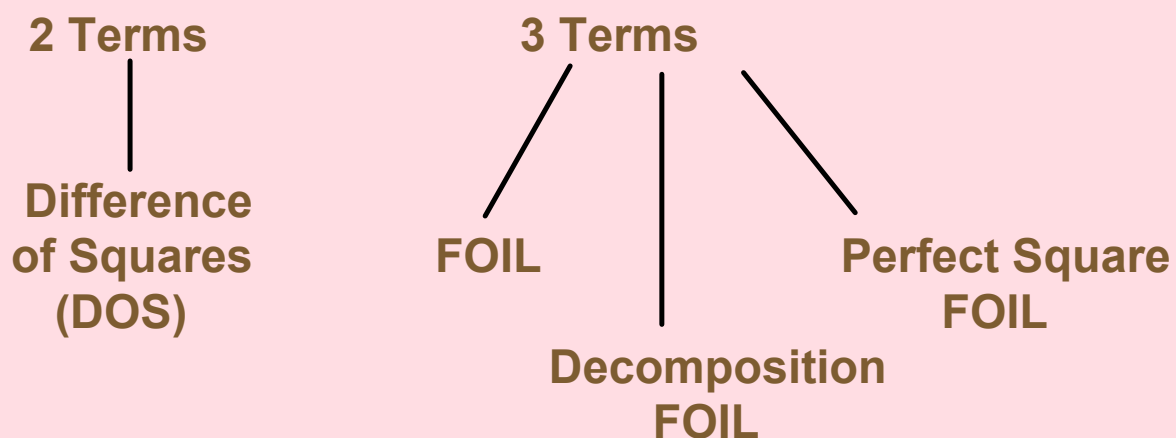
Always check to see that your factors are correct by multiplying

STEPS TO FACTORING

1. First, and always, look for a Greatest Common Factor (GCF).

$$5ab^2 - 10a^2b^2 + 25a^2b = 5ab\,(b - 2ab + 5a)$$

2. Determine what type of polynomial you have; if a GCF was found, determine what type of polynomial is left in the brackets.

   a) If it is a binomial, then check to see if it is a Difference of Squares.

   $$25x^2 - 64y^2 = (5x + 8y)\,(5x - 8y)$$

   If it is not, STOP, you are done factoring.

   b) If it is a trinomial, then see if it is an "Easy" trinomial $Ax^2 + Bx + C$
   where $A = 1$

   $$x^2 - 7x - 30 = (x - 10)\,(x + 3)$$

   OR a Perfect Square trinomial $Ax^2 + Bx + C$ where
   A, C = perfect squares

   $$16x^2 - 48xy + 36y^2 = (4x - 6y)^2$$

   OR requires Decomposition. $Ax^2 + Bx + C$ where
   $A \neq 1$ or a perfect square

   $$\begin{aligned} 6x^2 - 13x - 5 &= 6x^2 - 15x + 2x - 5 \\ &= 3x\,(2x - 5) + 1\,(2x - 5) \\ &= (2x - 5)\,(3x + 1) \end{aligned}$$

   If none of these are possible, STOP, you are done factoring.

   c) If it is a four term polynomial, then try to factor by grouping.

   $$\begin{aligned} 3x^2 - 4x - 6x + 8 &= x\,(3x - 4) - 2\,(3x - 4) \\ &= (3x - 4)\,(x - 2) \end{aligned}$$

   If this cannot be done, STOP, you are done factoring.

3. Keep factoring until you can no longer factor.

4. Check your answers by multiplying the factors together to see if you get the question you started with.

EXAMPLE **4** | Using reasoning to write an equation from its roots

Tori says she solved a quadratic equation by graphing. She says the roots were -5 and 7. How can you determine an equation that she might have solved?

Philip's Solution

$x = -5$ or $x = 7$

> The *x*-intercepts of the quadratic function are the roots of the equation.

$x + 5 = 0$ $x - 7 = 0$
One factor is $x + 5$.
The other factor is $x - 7$.

> I decided to use the roots to help me write the factors of the equation.

$$(x + 5)(x - 7) = 0$$
$$x^2 + 5x - 7x - 35 = 0$$
$$x^2 - 2x - 35 = 0$$

> I wrote the factors as a product. Since each root is equal to 0, their product is also equal to 0.
>
> I simplified to write the equation in standard form.

Attachments

FM11-7s1.gsp

7s2e2 final.mp4

fm7s2-p8.tns

FM11-7s3.gsp

fm7s3-p1.tns

FM11-7s3-2.gsp

fm7s3-p2.tns

fm7s3-p8.tns

FM11-7s4.gsp

7s4e3 final.mp4

fm7s4-p11.tns

7s5e2 finalt.mp4