Sum and Difference of Two Cubes:

we will do that part later

The sum of two cubes is a polynomial of the form $a^3 + b^3$ and can be factored using the formula:

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

The difference of two cubes is a polynomial of the form $a^3 - b^3$ and can be factored using the formula:

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

Example 2:

Factor each polynomial.

a.) $x^3 - 8$

=

b.) $x^3 + 1$

=

c.) $3x^3 - 81$

=

Since both terms divide evenly by 3, we factor out the 3 first:

$3x^3 - 81 = 3(\quad) = 3(\quad)(\quad)$

Perfect Squares

A perfect square trinomial is a trinomial of the form $a^2 + 2ab + b^2$ or $a^2 - 2ab + b^2$ and can be factored using the formulas:

$$a^2 + 2ab + b^2 = (a + b)^2$$

$$a^2 - 2ab + b^2 = (a - b)^2$$

Example 3:

Factor each trinomial:

a.) $x^2 + 6x + 9$

$a^2 + 2ab + b^2 = (a+b)^2$

$= (x+3)^2$

b.) $x^2 - 12x + 36$

$(x-6)^2$

c.) $2x^2 + 20x + 50$

$= 2(x^2 + 10x + 25)$

$= 2(x+5)^2$

NOTE:
All trinomials, even "special" ones, can be factored using the abc method!!!