

Factoring

Always look for a Greatest Common Factor **FIRST!!!**

Two Terms

(Must be in one of the following forms to factor with two terms)

Difference of Two Perfect Squares (DOTS)

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

Sum of Two Perfect Squares (SOTS)

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

OR

Sum Of Cubes - SOAP

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

OR

Difference of Cubes - SOAP

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

Three Terms

(List factors or Special Case)

List a's factors and list b's factors. Find the correct combination that multiplies to give you the last term and adds to give you the middle term.

OR

Perfect Square Trinomial

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

Special Types

Perfect Square Trinomial

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

Four Terms

(Grouping)

Group first two and last two terms and see if each pair has a G.C.F. (May need to change order of the terms)

$$2x^3 - 8x^2 + 3x - 12$$

THEN

If the G.C.F. of each pair results in a common binomial, factor out the binomial..

$$2x^2(x - 4) + 3(x - 4)$$

THEN

Write the binomial times the binomial created by the terms left when GCF. binomial was pulled out.

$$(x - 4)(2x^2 + 3)$$

1.) If nothing can be done to the original expression, then it is **PRIME**. 2.) Check to see if any of your final answers **will factor further**. 3.) Check your answer by multiplying.