

Factoring Flow chart

Factoring

Always look for a Greatest Common Factor FIRST!!!

2 TERMS

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

Difference of Two Perfect Squares

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

$$x^2 - 36 = (x + 6)(x - 6)$$

Sum Of Cubes - SOAP

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

$$x^3 + 4^3 = (x + 4)(x^2 - 4x + 16)$$

Difference of Cubes - SOAP

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

$$(2a)^3 - (3)^3 = (2a-3)(4a^2 + 6a + 9)$$

3 TERMS

(2()s or Pattern)

Guess and check

1. Multiply the leading coefficient and the constant term.

$$2x^2 + 3x - 5$$

$$(2x^2)(-5) = -10x^2$$

2. Find the pair of terms that multiplies to equal this number and adds to be the middle term of the trinomial. Rewrite the middle term as the sum of the two terms you found.

$$(5x)(-2x) = -10x^2 \text{ and } 5x + -2x = 3x$$

$$2x^2 - 2x + 5x - 5$$

3. Factor by grouping (4 terms)

$$(2x^2 - 2x) + (5x - 5)$$

$$2x(x - 1) + 5(x - 1)$$

4 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.