5.2 Part 1 FACTORING

Review...

Find the factors of 24. 1, 2, 3, 4, 6, 8, 12, 24

6×4 2×12

24×1 8×3

Factors are numbers or values multiplied together to get another number/value.

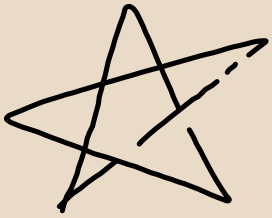
Multiply $(x + 2)(x + 3)$. FOIL

$(x)(x) + (x)(3) + (2)(x) + (2)(3)$

$x^2 + 3x + 2x + 6$

$x^2 + 5x + 6$

When factoring, always check for a GCF first!



GCF = Greatest Common Factor

Example 1: Find the GCF of $12x^3y^2$ and $42x^2y^4$.

$x \cdot x \cdot x$ $x \cdot x$

$12 = 2 \cdot 6$

$42 = 7 \cdot 6$

2 x's

2 y's

$GCF = 6x^2y^2$

Examples: Factor by taking the GCF out.

2. $11x + 44x^2y$

$GCF = 11x$

3. $25a^2b^2 - 30ab^3 + 15a^3b$

$GCF = 5ab$

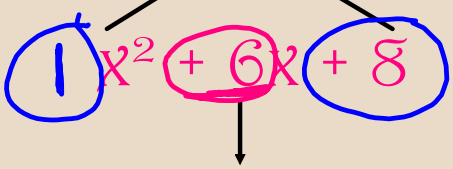
Factor the trinomial: $x^2 + 6x^1 + 8$

descending

STEP 1: Make sure the trinomial is written in ascending or descending order.

STEP 2: Make a sum & product chart.

Multiply the coefficient and the constant to find the PRODUCT.



The coefficient for the middle term is the SUM.

START

SUM 6	PRODUCT 8
~~1 x 8~~	~~-1 x -8~~
2 x 4	~~-2 x -4~~

2 + 4

STEP 3: Divide each number by the coefficient of the first term. $\frac{2}{1}$ $\frac{4}{1}$

STEP 4: If possible reduce.

STEP 5: Denominator = constant/coefficient of first term (front)
Numerator = constant/coefficient of last term (back)

$x^2 + 6x + 8$

$(1x + 2)(1x + 4)$

var. in front b/c var. are front heavy

4. Factor $6b^2 + 22b + 20$. GCF = 2

$2(3b^2 + 11b + 10)$

sum 11 | product 30

$5+6$

~~1×30~~ ~~-1×-30~~
~~2×15~~ ~~-2×-15~~
~~3×10~~ ~~-3×-10~~
5×6 ~~-5×-6~~

$\frac{5}{3}$ $\frac{6\div3}{3\div3}$ $\frac{2}{1}$

$2(3b+5)(1b+2)$

5. Factor $20f^2 + 5f - 15$. GCF = 5

$5(4f^2 + 1f - 3)$

sum 1 | product −12

$-3+4$

~~$-1\cdot12$~~ ~~$1\cdot-12$~~
~~$-2\cdot6$~~ ~~$2\cdot-6$~~
$-3\cdot4$ ~~$3\cdot-4$~~

$\frac{-3}{4}$ $\frac{4\div4}{4\div4}$ $\frac{1}{1}$

$5(4f-3)(1f+1)$

6. Factor $3p^2 + 10p + 3$.

sum 10	product 9
$1+9$ ↑	$1 \cdot 9$ ~~$-1 \cdot -9$~~
	~~$3 \cdot 3$~~ ~~$-3 \cdot -3$~~

$\frac{1}{3}$ $\frac{9}{3} = \frac{3}{1}$

$(3p+1)(1p+3)$