

Expand this $(x + 3)(x + 7) \longrightarrow x^2 + 10x + 21$

- Remove Parentheses
- Distributive Property
- Multiplication

Factor this $x^2 + 10x + 21 \longrightarrow (x + 3)(x + 7)$

- Put Parentheses back into problem
- Reverse of Distributive Property
- Division

Sec 5-4 Factoring Quadratic Expressions

Factoring should always start with

GCF

Factor the following: $12x^2 - 18x$

$$= 6x(2x - 3)$$

Always start with GCF because sometimes that is the only factoring you can do!

Factor the following:

$$4b^3 + 12b^2 - 216b$$

$$\text{GCF} = 4b \longrightarrow 4b(b^2 + 3b - 54)$$

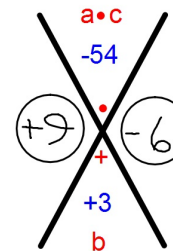
Now we must try to factor this trinomial to complete the factoring and end up with: $4b(\quad)(\quad)$

Factoring a Trinomial:

$$ax^2 + bx + c$$

$$b^2 + 3b - 54$$

Step 1:
The X



Start here with
GCF of top row

$$\begin{matrix} b \\ -b \end{matrix}$$

Step 2:
The Box

ax^2 b^2	$\# \text{ from } X$ $+9b$
$\# \text{ from } X$ $-6b$	c -54

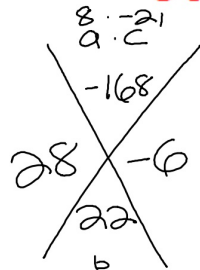
Step 3:
The Factors

Write out the factors:

$$4b(b+9)(b-6)$$

Factor

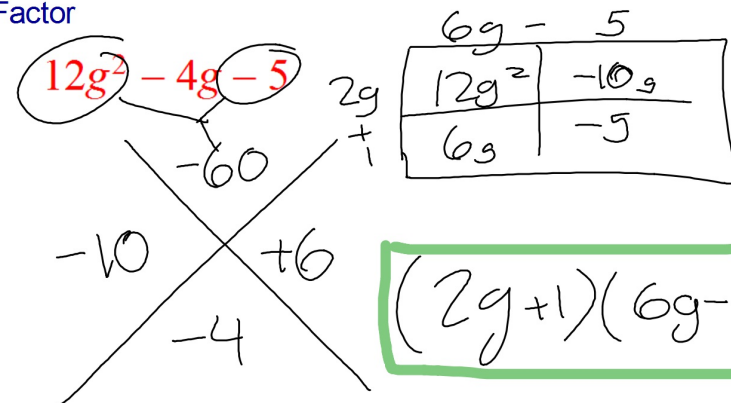
$$8c^2 + 22c - 21$$



$4c$	$2c + 7$
$8c^2$	$28c$
$-6c$	-21

$$(4c-3)(2c+7)$$

Factor



$6g - 5$
$12g^2$
$-10g$
$6g$
-5

$$(2g+1)(6g-5)$$

$$30w^2 - 108w - 48$$

$$6(5w^2 - 18w - 8)$$

$5w$	$+ 2$
$5w^2$	$2w$
$-20w$	-8

$$6(5w+2)(w-4)$$

Factor Completely.

$$48g^3 + 20g^2 - 12g$$

$$4g(4g+3)(3g+1)$$

$$4g(12g^2 + 5g - 3)$$

$3g$	$+ 1$
$12g^2$	$+ 9g$
$-4g$	-3