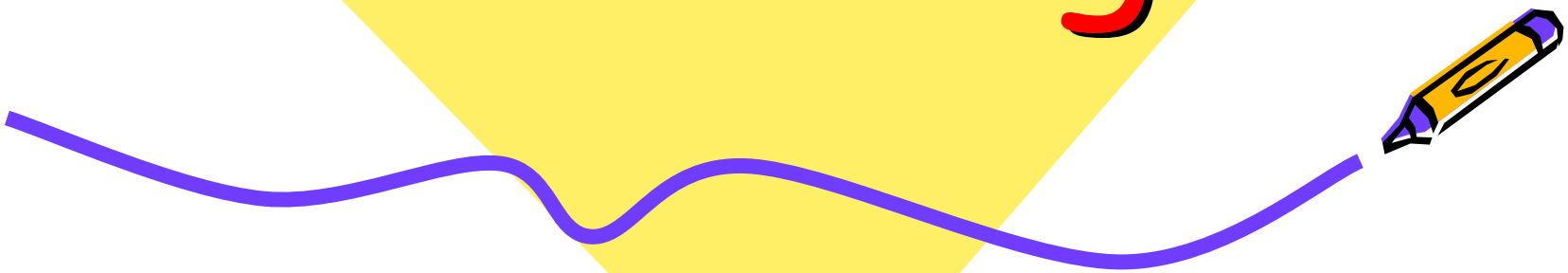
X-box Factoring

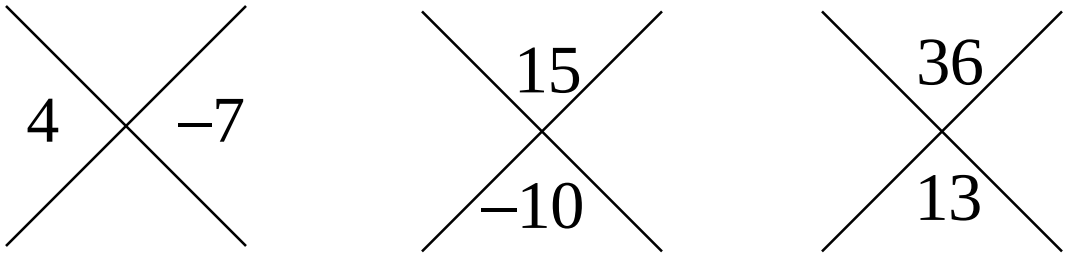


Warm-Up

Please complete these individually.

1. Fill in the following X-solve problems.

a. b. c.

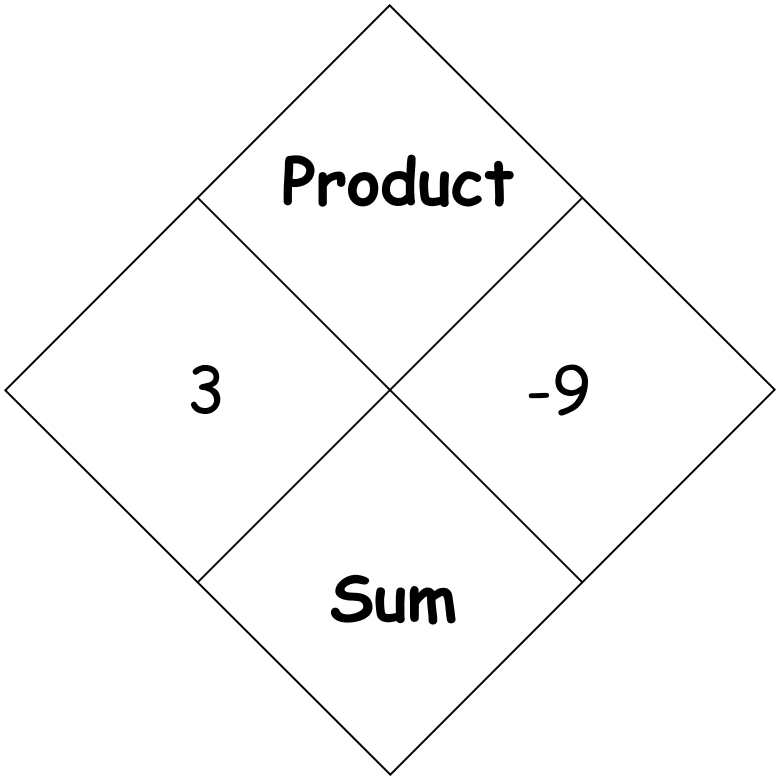


2. Write the general form of a quadratic equation.

3. Divide using the box method.

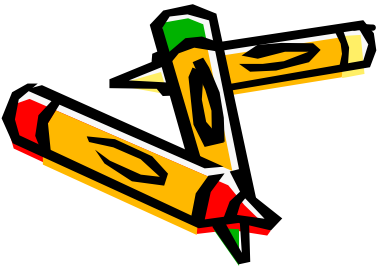
a. $\frac{4a^3 + 12a^2 + 6a}{2a}$ b. $\frac{14x^5y^3 - 35x^4y^2 + 21x^2y}{7xy}$

X- Box



X-box Factoring

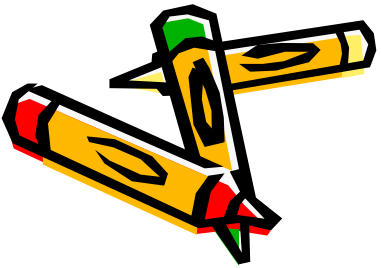
- This is a guaranteed method for factoring quadratic equations—no guessing necessary!
- We will learn how to factor quadratic equations using the x-box method
- Background knowledge needed:
  - Basic x-solve problems
  - General form of a quadratic equation
  - Dividing a polynomial by a monomial using the box method



Standard 11.0

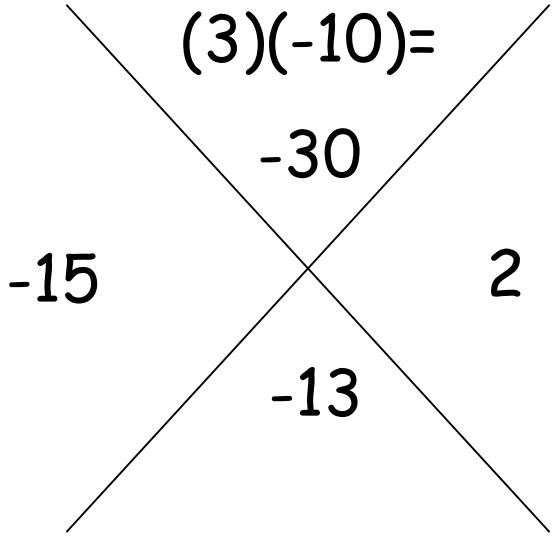
Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.

Objective: I can use the x-box method to factor non-prime trinomials.



Factor the x-box way

Example: Factor $3x^2 - 13x - 10$

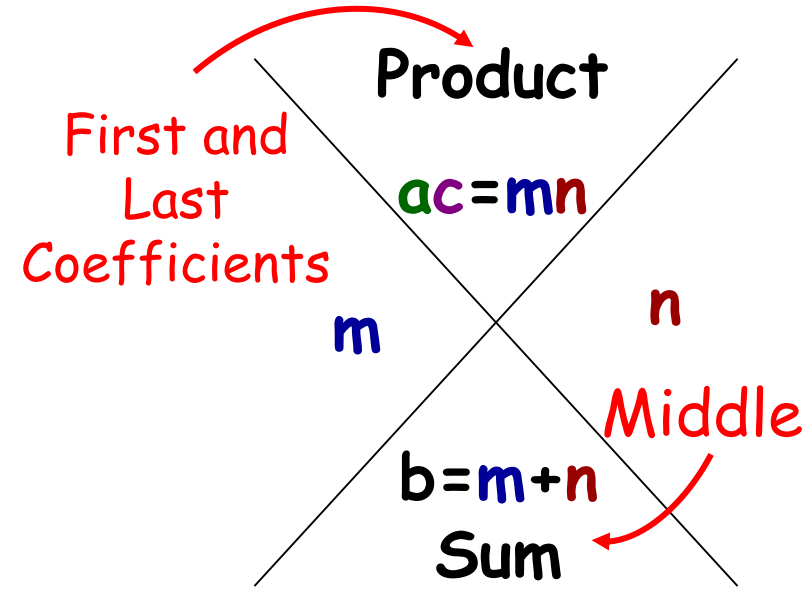


	x	-5
3x	$3x^2$	-15x
+2	2x	-10

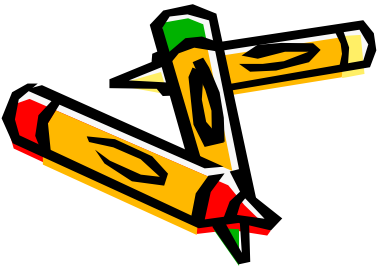
$3x^2 - 13x - 10 = (x-5)(3x+2)$

Factor the x-box way

$y = ax^2 + bx + c$



	Base 1	Base 2
GCF	1st Term	Factor n
Height	Factor m	Last term

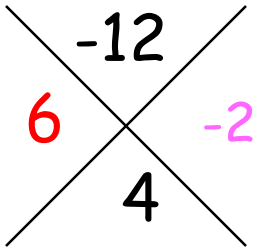


Examples

Factor using the x-box method.

1. $x^2 + 4x - 12$

a)



b)

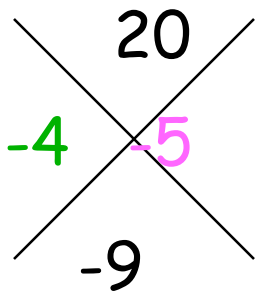
	x	+6
x	x^2	6x
-2	-2x	-12

Solution: $x^2 + 4x - 12 = (x + 6)(x - 2)$

Examples continued

2. $x^2 - 9x + 20$

a)



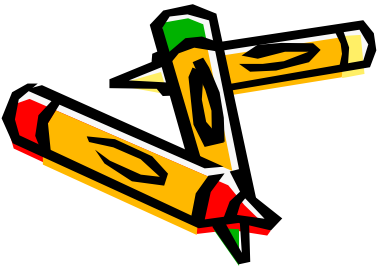
b)

	x	-4
x	x^2	-4x
-5	-5x	20

Solution: $x^2 - 9x + 20 = (x - 4)(x - 5)$

Think-Pair-Share

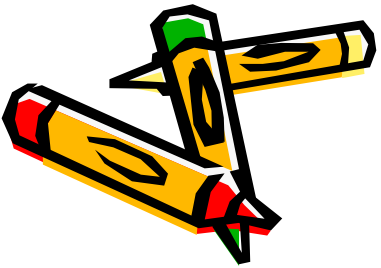
1. Based on the problems we've done, list the steps in the diamond/box factoring method so that someone else can do a problem using only your steps.
2. Trade papers with your partner and use their steps to factor the following problem: $x^2 + 4x - 32$.



Trying out the Steps

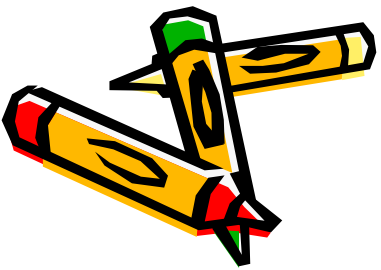
3. If you cannot complete the problem using only the steps written, put an arrow on the step where you stopped. Give your partner's paper back to him.
4. Modify the steps you wrote to correct any incomplete or incorrect steps. Finish the problem based on your new steps and give the steps back to your partner.
5. Try using the steps again to factor:

$$4x^2 + 4x - 3.$$



Stepping Up

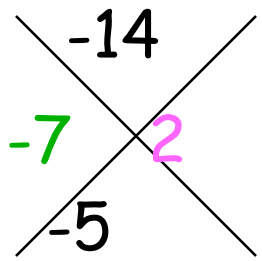
6. Edit your steps and factor: $3x^2 + 11x - 20$.
7. Formalize the steps as a class.



Examples continued

3. $2x^2 - 5x - 7$

a)



b)

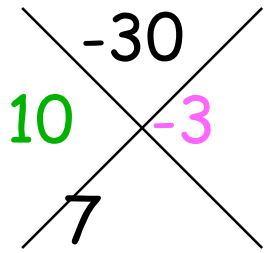
	2x	-7
x	$2x^2$	-7x
+1	2x	-7

Solution: $2x^2 - 5x - 7 = (2x - 7)(x + 1)$

Examples continued

3. $15x^2 + 7x - 2$

a)



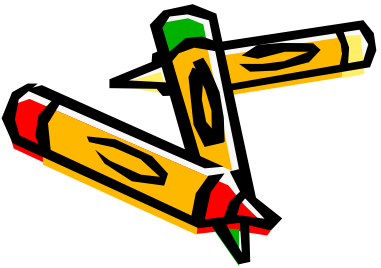
b)

	3x	+2
5x	$15x^2$	10x
-1	-3x	-2

Solution: $15x^2 + 7x - 2 = (3x + 2)(5x - 1)$

Guided Practice

Grab your white boards, pens and erasers!



Independent Practice

Do the worksheets for Homework using the x-box method. Show all your work to receive credit- don't forget to check by multiplying!