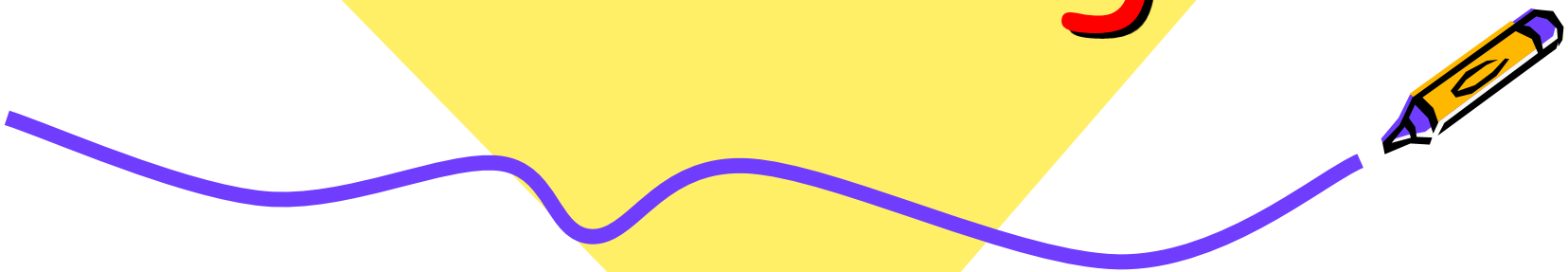
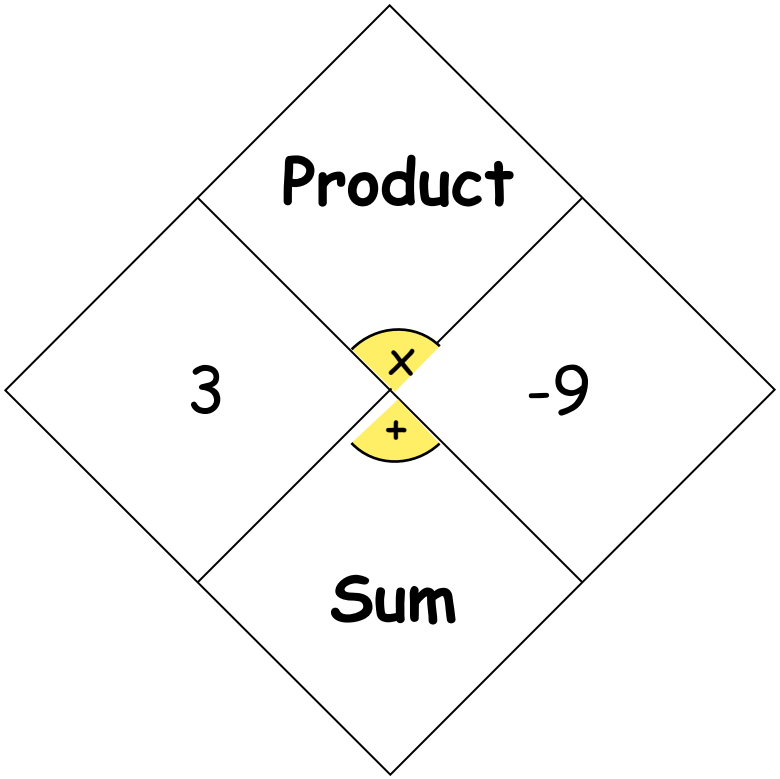
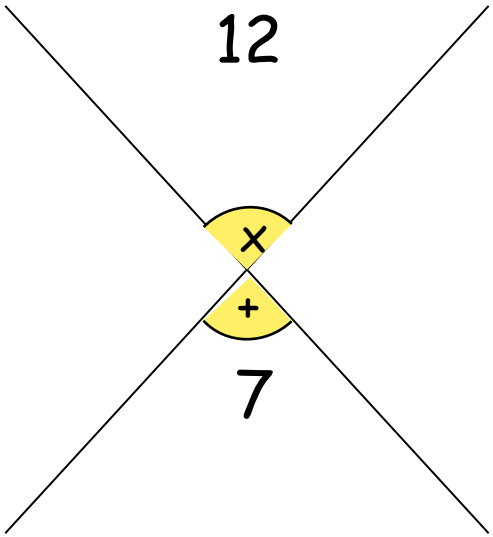
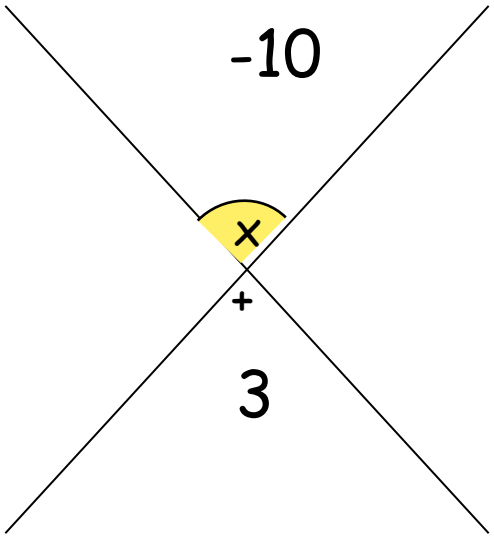
X-box Factoring

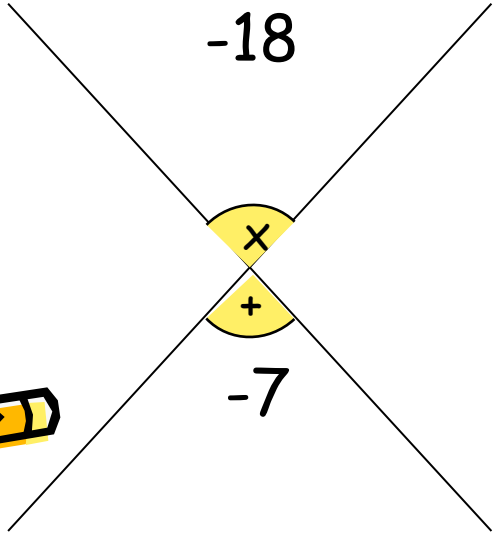


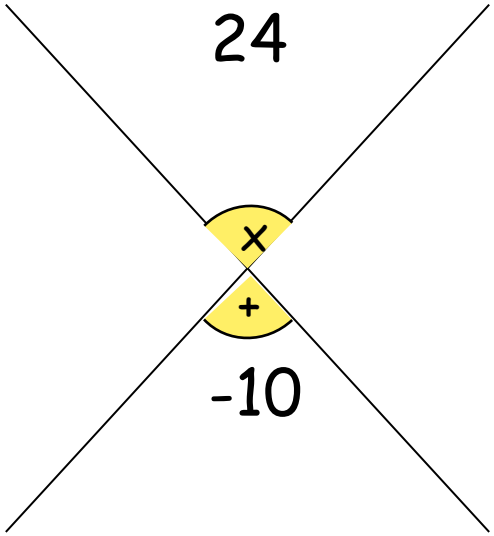
X- Box




12
x
+
7

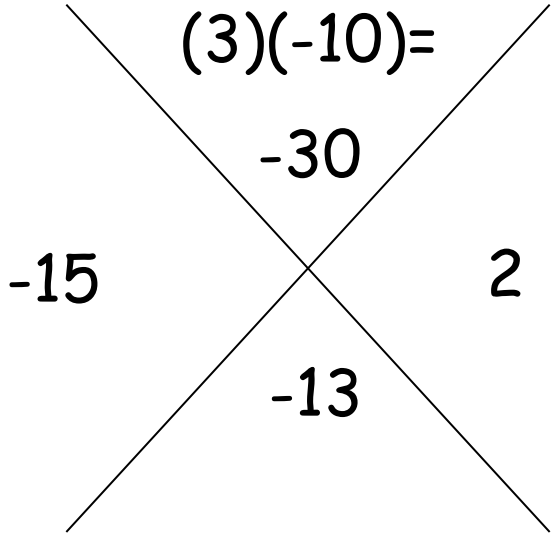

-10
x
+
3


-18
x
+
-7


24
x
+
-10

Factor the x-box way

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

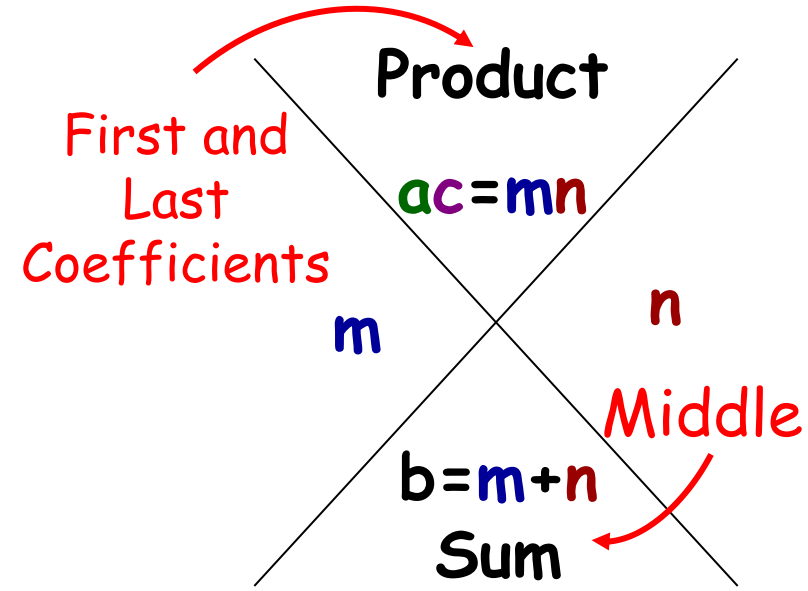


	x	-5
3x	$3x^2$	-15x
+2	2x	-10

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

Factor the x-box way

$y = ax^2 + bx + c$



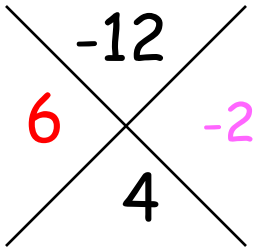
	Base 1	Base 2
GCF	1st Term	Factor n
Height	Factor m	Last term

Examples

Factor using the x-box method.

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

a)



b)

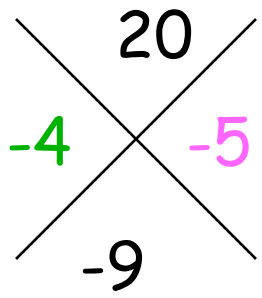
	x	+6
x	x^2	6x
-2	-2x	-12

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:

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

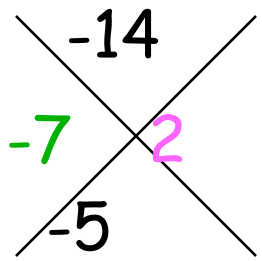
Stepping Up

6. Edit your steps and factor: $x^2 + 8x - 20$.
7. Formalize the steps as a class.

Examples continued

$2x^2 - 5x - 7$

a)



b)

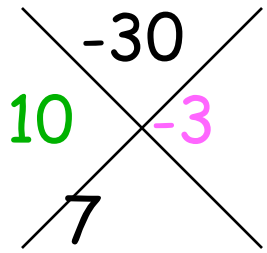
	2x	-7
x	$2x^2$	-7x
+1	2x	-7

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

Examples continued

$15x^2 + 7x - 2$

a)



b)

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

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

Factor each completely.

1) $b^2 + 8b + 7$

2) $n^2 - 11n + 10$

3) $m^2 + m - 90$

4) $n^2 + 4n - 12$

5) $n^2 - 10n + 9$

6) $b^2 + 16b + 64$