

Factoring $ax^2 + bx + c$ when $a > 1$

Box Method - Factoring the GCF

- 1) Look to factor out a GCF from all terms whenever possible.
- 2) Multiply "a" and "c" terms and find the factors that sum to the "b" term
(exact same process as equations where $a=1$)
- 3) Create a "2x2 Box"
 - "a" term is in the upper left
 - "b" factors are in the upper right and lower left
 - "c" term is in the lower right
- 4) Factor out the GCF from each column and row; place the number/variable on the outside of the box using the +/- sign closest to the outside edge of the box
- 5) The numbers on the outside of the box is the factoring (parentheses)

Use the Box Method to factor $3x^2 - 2x - 5$

$$ac = 3(-5) = -15$$

Factor of -15

$$\boxed{3, -5}$$

$$-3, 5$$

$$-15, 1$$

$$-1, 15$$

x

1

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

$$(3x - 5)(x + 1) = 0$$

Use the Box Method to factor $6x^2 - 19x + 15$

Factors of 90

Sum of factors

-1, -90

- 91

-2, -45

- 47

-3, -30

- 33

-5, -18

- 23

-6, -15

- 21

-9, -10

- 19

Use the Box Method to factor $6x^2 + -19x + 15$

$$ac = 6(15) = 90$$

factors that
sum to -19
and product
of 90

-9 and -10

$3x$

-5

$2x$

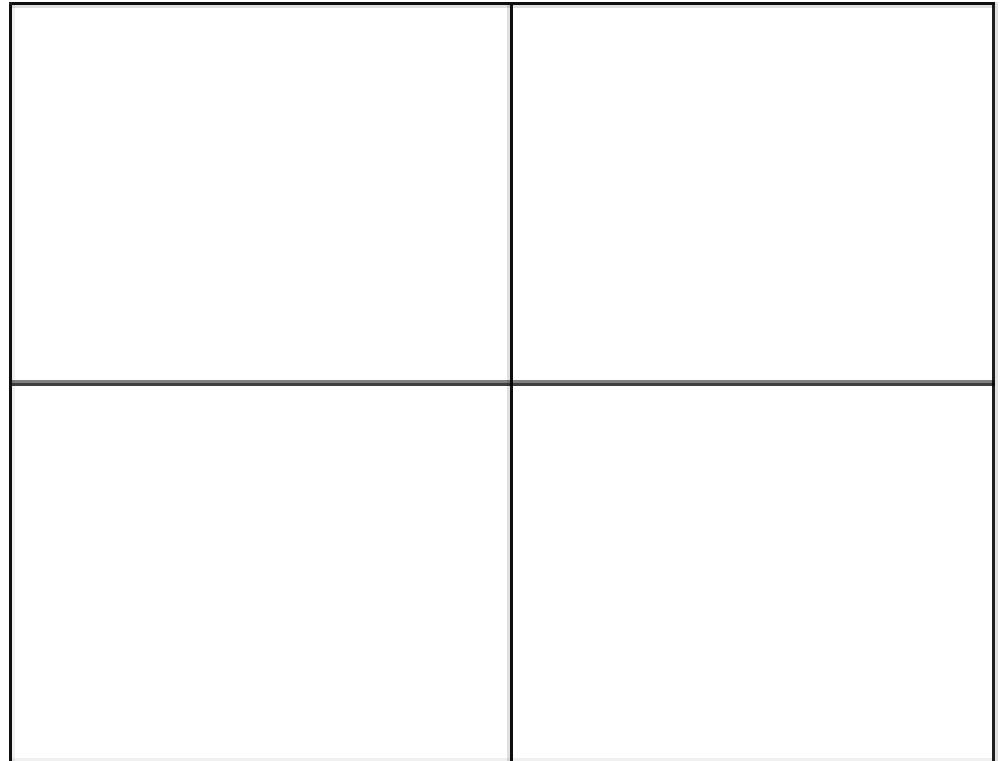
-3

$6x^2$	$-9x$
$-10x$	15

factor GCF
using box ; watch
the signs

$$(2x-3)(3x-5)=0$$

Use the Box Method to factor $7x^2 + 11x - 30$



Use the Box Method to factor $7x^2 + 11x - 30$

$$ac = 7(-30) = -210$$

factors the
sum to 11
and product
of -210

21 and -10

7x

-10

x

3

$7x^2$	$21x$
$-10x$	-30

factor GCF
using box ; watch
the signs

$$(x+3)(7x-10) = 0$$

It doesn't matter if the factors switch spots within the box. The factoring is not changed.

Use the Box Method to factor $7x^2 + 11x - 30$

$$ac = 7(-30) = -210$$

factors the
sum to 11
and product
of -210

21 and -10

x

3

$7x$

-10

$7x^2$	$-10x$
$21x$	-30

factor GCF
using box ; watch
the signs

$$(x+3)(7x-10) = 0$$