

Starter 13 FEB 2018

Factor. GCF 1, 2, ~~3~~, ~~6~~

$12x^2 - 14x + 6$

$2(6x^2 - 7x + 3)$

$$m^2 - 3m = 0$$

$$m(m - 3) = 0$$

$m = 0$   $m - 3 = 0$

$m = 3$

Multiply  $(x+3)(x-5) = x^2 - 2x - 15$

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

Diagram illustrating the multiplication of  $(x+3)(x-5)$  using a grid. The grid shows the terms  $x^2$ ,  $3x$ ,  $-5x$ , and  $-15$ . A large oval encircles the terms  $3x$  and  $-5x$ , with an arrow pointing to  $-2x$  in the equation above. Another arrow points from  $x^2$  in the equation to  $x^2$  in the grid. A third arrow points from  $-15$  in the equation to  $-15$  in the grid.

To factor a trinomial, we will go backwards using the box method.

IDO:  $x^2 + 8x + 12 = (x+2)(x+6)$

Step 1: Place the  $x^2$  (first term) in the first box.

Step 2: Decide the length and width of the first box.

Step 3: Place the 12 (last term) in the last box.

Step 4: Write the possible factors of 12.

Step 5: Try the factors until the diagonal adds to  $8x$ .

$\frac{12}{1, 2, 3, 4, 6, 12}$

$6x + 2x = 8x$

✓

$x \quad 3$

<del><math>x^2</math></del>	$3x$
$4x$	$12$

$4x + 3x = 7x$

NOPE

<del><math>x</math></del>	<del><math>2</math></del>
$x^2$	$2x$
$6x$	$12$

IDO:  $10x^2 + 11x - 6 = (5x-2)(2x+3)$

Step 1: Place the  $10x^2$  (first term) in the first box.

Step 2: Decide the length and width of the first box.

Step 3: Place the  $-6$  (last term) in the last box.

Step 4: Write the possible factors of  $-6$ .

Step 5: Try the factors until the diagonal adds to  $11x$ .

2<sup>nd</sup> attempt:

$5x \quad -2$

<del><math>10x^2</math></del>	$-4x$
$15x$	$-6$

$15x + -4x = 11x$  ✓

$5x \quad -3$

$10x^2$	$-6x$
$40x$	$-6$

$10x + -6x = 4x$

Try again

$1, 2, 3, 6$

WE DO: Factor  $3x^2 - 19x + 28 = (x-4)(3x-7)$

$3x$	$3x^2$	$-21x$
$-4$	$-4x$	$28$

$x - 7$

$1$	$2$	$4$	$7$	$4$	$28$
-----	-----	-----	-----	-----	------

$-4x + -21x = -25x$   
Nope

$3x$	$3x^2$	$-12x$
$-7$	$-7x$	$28$

$x - 4$

$-12x + -7x = -19x$

WE DO: Factor  $x^2 + 3x - 18 = (x-3)(x+6)$

$x$	$x^2$	$-3x$
$6$	$6x$	$-18$

$1$	$2$	$3$	$6$	$9$	$18$
-----	-----	-----	-----	-----	------

$6x + -3x = 3x$

$x$	$x^2$	
		$-18$

YOU DO: Factor  $5x^2 + 13x + 6 = (x+2)(5x+3)$

$5x$	$x$	$6$
$5x$	$5x^2$	$30x$
$1$	$1x$	$6$

$5x$	$x$	$1$
$5x$	$5x^2$	$5x$
$6$	$6x$	$6$

$5x + 6x = 11x$

$5x$	$x$	$2$
$5x$	$5x^2$	$10x$
$3$	$3x$	$6$

$10x + 3x = 13x$

$6$
$1, 6$
$2, 3$

WE DO: Factor  $x^2 - 8x + 16 = (x-4)(x-4) = \underline{\underline{(x-4)^2}}$

$x$	$x$	$-4$
$x$	$x^2$	$-4x$
$-4$	$-4x$	$16$



$-4x + -4x = -8x$

Perfect Square trinomial

$16$
$1 \cdot 16$
$2 \cdot 8$
$4 \cdot 4$

WE DO: Factor  $3x^2 - 17x + 10 = (3x - 2)(x - 5)$

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

$3x \quad -2$   
 $-15x + 2x = -17x$   
          

$CLT$


$\frac{10}{1 \cdot 10}$
$2 \cdot 5$

YOU DO: Factor  $5x^2 + 8x - 4 =$  \_\_\_\_\_

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

$5x \quad -1$   
 $20x + (-x) = 19x$   
NOPE


$\frac{4}{1 \cdot 4}$
$2 \cdot 2$

  

$x$	$5x^2$	$4x$
$-1$	$-5x$	$-4$

$5x \quad 4$   
 $-5x + 4x = -1x$   
NOPE

YOU DO: Factor  $5x^2 + 8x - 4 = (5x - 2)(x + 2)$

	$5x$	$-2$
$x$	$5x^2$	$-2x$
$2$	$10x$	$-4$

Try # 3  
 $10x + -2x = 8x$   
 ✓


WE DO: Factor  $7x^2 + 25x - 12 = (7x - 3)(x + 4)$

	$7x$	$-3$
$x$	$7x^2$	$-3x$
$4$	$28x$	$-12$


$28x + -3x = 25x$   
 ✓

$12 = 1 \cdot 12$   
 $2 \cdot 6$   
 $3 \cdot 4$