

November 7, 2017

### Factoring Trinomials

$ax^2 + bx + c; a = 1$

Steps

- Factor out GCF if it exists.
- Find  $ac$  (Product)
- Find  $b$  (Sum)
- Find our two numbers that equal our product and sum.
- Factor by Grouping

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### Sign Patterns

$p(ac) \quad q(b)$

$+ \quad +$  Both numbers are positive.

$x^2 + 7x + 12 = (x+4)(x+3)$

$+ \quad -$  Both numbers are negative.

$x^2 - 7x + 12 = (x-4)(x-3)$

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$p \quad q$

$- \quad +$  opposite signs; where the larger number is positive.

$x^2 + x - 12 = (x+4)(x-3)$

$- \quad -$  opposite signs; where the larger number is negative.

$x^2 - x - 12 = (x-4)(x+3)$

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$x^2 - 25x + 84$  \* no GCF

$+p \quad 1 \quad ac = +84$   
 $-q \quad 2 \quad b = -25$

		x	+
20	5	100	✓
19	6	114	✓
21	4	84	✓

$x^2 - 21x - 4x + 84$

GCF:  $x$       GCF:  $-4$

$x(x-21) - 4(x-21)$

GCF:  $(x-21)$

$(x-21)(x-4)$

$x^2 - 4x - 21x + 84$   
 $x^2 - 25x + 84$  ✓

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$x^2 + 13x - 30$

$1 \quad ac = -30$   
 $2 \quad b = +13$

		x	+
15	2	-30	✓

$x^2 + 15x - 2x - 30$

$x(x+15) - 2(x+15)$

$(x+15)(x-2)$

$x^2 - 2x + 15x - 30$   
 $+13x$  ✓

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$3x^2 + 19x + 28$  \* no GCF

$a \neq 1 \rightarrow a = 3$

$1 \quad ac = +84$   
 $2 \quad b = +19$

		x	+
15	4	60	✓
16	3	48	✓
14	5	70	✓
12	7	84	✓

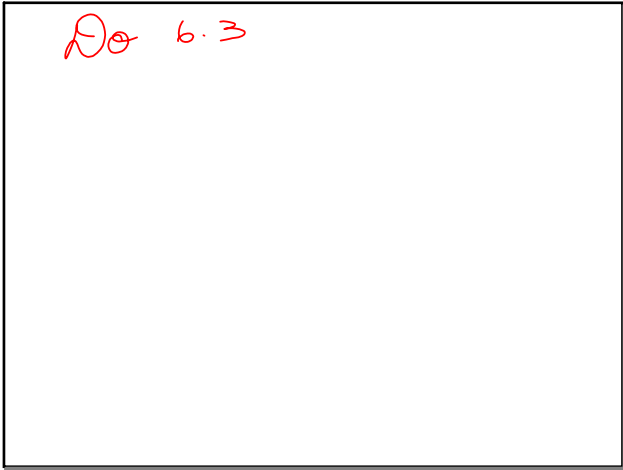
$3x^2 + 12x + 7x + 28$

$3x(x+4) + 7(x+4)$

$(x+4)(3x+7)$

$3x^2 + 7x + 12x + 28$   
 $19x$  ✓

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