

Algebra 1

Factoring Quadratics: Part 2






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$ax^2 + bx + c$

((quadratic))

zeros roots







Overview

x in. (x - 15) in.

Area = 100 in.²

$x(x - 15) = 100$

$x^2 - 15x = 100$

$x^2 - 15x - 100 = 0$

$(x - 20)(x + 5) = 0$

$(x - 20) = 0$ or $(x + 5) = 0$

$x - 20 = 0$ $x + 5 = 0$

$x = 20$ $x = -5$

$20(20 - 15) = 100$

$20(5) = 100$





Factoring Quadratics: Part 2

x in.
Area = 100 in.²
(x - 15) in.

zeros
roots

$x^2 - 15x - 100 = 0$
 $(x - 20)(x + 5) = 0$

$x^2 - 15x - 100$

$(-5, 0)$ $(20, 0)$

Factoring Quadratics: Part 2

Find the roots
of this equation:
 $x^2 - 4x + 4 = 0$

$y = mx + b$

$\Delta < 0$
 $\Delta = 0$
 $\Delta > 0$

You Try!

Find the roots
of this equation:
 $x^2 - 4x + 4 = 0$

$2 * 2$ $4 * 1$
 $-2 * -2$ $-4 * -1$

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

$(2, 0)$

You Try!

$ax^2 + bx + c$

$2x^2 - 7x + 3$

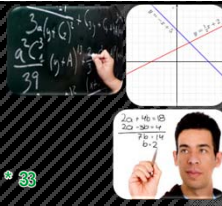
$2 \cdot 1$ $-1 \cdot 3$

$-2x + (-3x) = -5x$ $(2x - 3)(x - 1)$
 $-6x + (-1x) = -7x$ $(2x - 1)(x - 3)$

$(2x - 1)(x - 3)$

FOIL

Factoring Quadratics: Part 2



factor: $3c^2 - 17c + 10$



You Try!

factor: $3c^2 - 17c + 10$

$3 \cdot 1 = (3c - 2)(c - 5)$

$3(-1) + 1(-10) = -13$ $-1 \cdot -10$
 $3(-10) + 1(-1) = -31$ $-10 \cdot -1$
 $3(-5) + 1(-2) = -17$ $-5 \cdot -2$
 $-2 \cdot -5$



You Try!

Factor: $3x^2 + 14x - 5$

Factors of 3	Factors of -5	Possible Factorization	Middle Term

$\uparrow$ ax^2 term $\uparrow$ c term

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

Factoring Quadratics: Part 2

Factor: $4x^2 + 9x - 9$

$y = mx + b$

$\Delta < 0$
 $\Delta = 0$
 $\Delta > 0$

You Try!

Factor: $4x^2 + 9x - 9$

Factors of 4	Factors of -9	Possible Factorization	Middle Term
4, 1	3, -3	$(4x + 3)(x - 3)$	$-12x + 3x = -9x$
4, 1	-3, 3	$(4x - 3)(x + 3)$	$12x - 3x = 9x$
4, 1	9, -1	$(4x + 9)(x - 1)$	$-4x + 9x = 5x$
4, 1	-9, 1	$(4x - 9)(x + 1)$	$4x - 9x = -5x$
2, 2	3, -3	$(2x + 3)(2x - 3)$	$-6x + 6x = 0$
2, 2	-3, 3	$(2x - 3)(2x + 3)$	$6x - 6x = 0$
2, 2	9, -1	$(2x + 9)(2x - 1)$	$-2x + 18x = 16x$
2, 2	-9, 1	$(2x - 9)(2x + 1)$	$2x - 18x = -16x$

$(4x - 3)(x + 3)$

You Try!

Factor: $-2z^2 + 5z + 3$
Factor: $(-1)[2z^2 - 5z - 3]$
 $= (-1)[(2x + 1)(x - 3)]$
 $= -(2x + 1)(x - 3)$

Factors of 2	Factors of -3	Possible Factorization	Middle Term
2, 1	3, -1	$(2x + 3)(x - 1)$	$-2x + 3x = x$
2, 1	-3, 1	$(2x - 3)(x + 1)$	$2x - 3x = -x$
2, 1	1, -3	$(2x + 1)(x - 3)$	$-6x + x = -5x$
2, 1	-1, 3	$(2x - 1)(x + 3)$	$6x - x = 5x$

Factoring Quadratics: Part 2

factor $-2c^2 - 5c - 3$

$y = mx + b$

$x < 0$
 $x = 0$
 $x > 0$

You Try it!

factor $-2c^2 - 5c - 3$
 $= -[2c^2 + 5c + 3]$

middle term

2, 1 $(2c + 3)(c + 1)$ 3, 1 $2c + 3c = 5c$
 $(2c + 1)(c + 3)$ 1, 3
 $(2c - 3)(c - 1)$ -3, -1
 $-1, -3$

$= -(2c + 3)(c + 1)$

You Try it!
