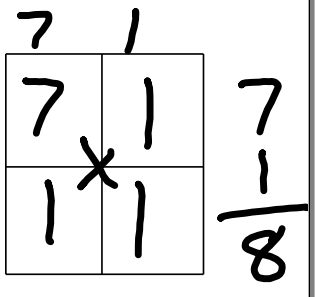
Warm up

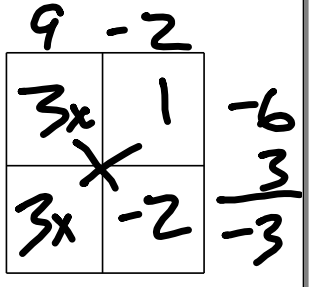
1) $7x^2 + 8x + 1$

$(7x+1)(1x+1)$



2) $9x^2 - 3x - 2$

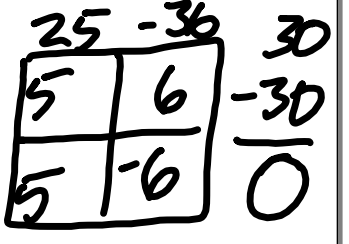
$(3x+1)(3x-2)$



3) $\frac{16x^2}{8x} - \frac{8x}{8x}$ $8x(2x-1)$

4) $25n^2 - 36$ $(5n-6)(5n+6)$

$30n - 30n$



4-1

Solving by Factoring

Objective: I can solve quadratic equations by factoring and using the zero-product property.

I can write a quadratic equation given the zeros or x-intercepts

Vocabulary: Zeros/Roots, X-Intercepts, Zero-Product Propery, Solve,

What does it mean to "solve" an equation?

To find an answer

$x = 4$

The Zero-Product Property

$$(?)(??)=0$$

$3 \cdot x = 0$

$x \cdot y = 0$ $\quad x=0 \quad y=0$

The Zero-Product Property

If ab = 0, then a = 0 or b = 0 or both a and b are 0

Solve

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

$x + 5 = 0$

$-5 \quad -5$

$x = -5$

$2x - 3 = 0$

$+3 \quad +3$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

Solve

$x(x + 9) = 0$

$x = 0$ $\quad x + 9 = 0$

$-9 \quad -9$

$x = -9$

Your turn! Solve

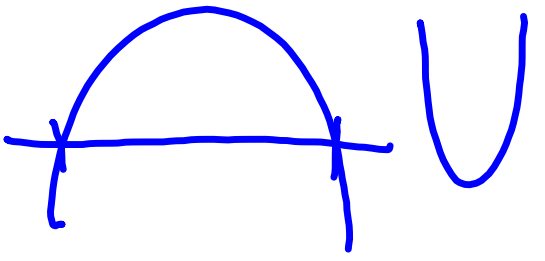
$(x - 1)(4x + 7) = 0$

$x = 1 \quad x = -\frac{7}{4}$

$4x + 7 = 0$

$-7 \quad -7$

$\frac{4x}{4} = \frac{-7}{4}$



Solve by factoring

$2x^2 - 5x = 3$

$-3 \quad -3$

$2x^2 - 5x - 3 = 0$

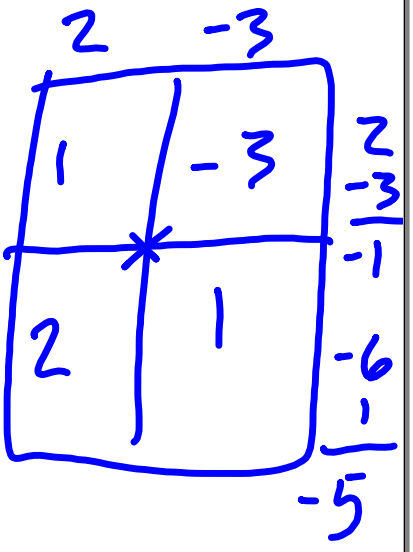
$(1x - 3)(2x + 1) = 0$

$x - 3 = 0 \qquad 2x + 1 = 0$

$x = 3 \qquad 2x = -1$

$\frac{2x}{2} = \frac{-1}{2}$

$x = -\frac{1}{2}$



Solve by factoring

$x^2 + 10x + 15 = -6$

$+6 \quad +6$

$x^2+10x+15+6=0$

$x^2+16x+21$

	1	21
1	1	3
7	1	7

7, $+3$, 10

$(1x+3)(1x+7)=0$

$1x+3=0 \quad 1x+7=0$

$-3 \quad -3 \quad -7 \quad -7$

$x=-3 \quad x=-7$

$x^2 + 5x + 4 = 4$

$-4 \quad -4$

$x^2-5x+0=0$

	1	0
1	1	0
-5	1	-5

0, -5, -5

$x^2-5x=0$

$x(x-5)=0$

$x=0 \quad x-5=0$

$x=5$

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

$x=0 \quad x-5=0$

$x=5$

Your Turn!

Solve by factoring

$x^2 + 5x + 4 = 0$

$2x^2 + 12x = -18$

Fundamental Theorem of Algebra

$x^2 + 4x + 2 \rightarrow$ 2 Sol'n

$x^7 - 4x^5 + 3x^2 + 2 \rightarrow$ 7 Sol'n

Write a function with zeros of -1 and 3

$x = -1$ $\quad$ $x = 3$

$+1 \quad +1$ $\quad$ $-3 \quad -3$

$x + 1 = 0$ $\quad$ $x - 3 = 0$

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

Write a function with zeros of -2 and -6

$x = -2$ $\quad$ $x = -6$

$(x+2) = 0$ $\quad$ $(x+6) = 0$

$(x+2)(x+6) = 0$

Check

Solve by factoring: $2x^2 + 13x = -15$

Find the zeros of the function: $y = x^2 - 2x - 15$

Write an equation with zeros of 1/2 and -5

Vocabulary: Zeros/Roots, X-Intercepts, Zero-Product Propery, Solve,