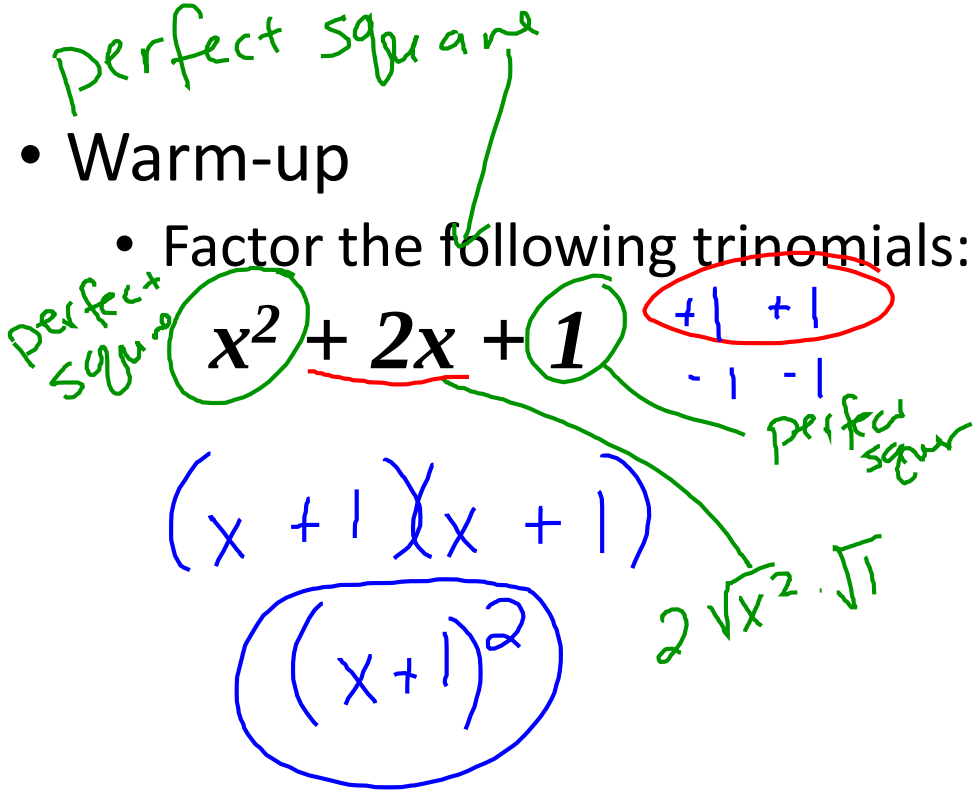
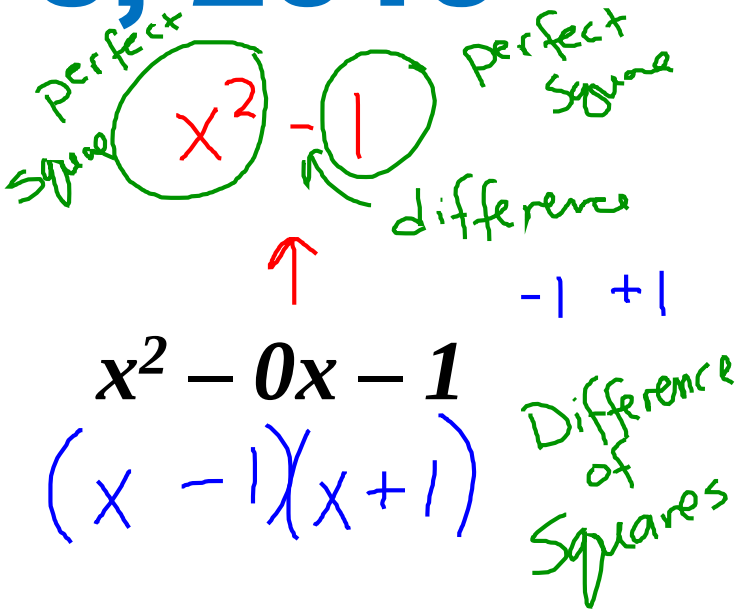
Tuesday, March 5, 2019

- Warm-up
  - Factor the following trinomials:





- Using the factors to solve…
- Using quadratic formula to solve

Objectives:

Content: I will solve quadratics both with factoring and quadratic formula.

Social: I will demonstrate my work to the group as well as the class.

Language: I will write my factoring and solving process clearly for myself and others.

Zero product property

How can I multiply to get zero?

_ x _ = 0

at least one must be zero

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So … if a * b = 0, what must be true?

$a = 0$ and/or $b = 0$

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So … if $(x + 3)(x - 6) = 0$?

$x + 3 = 0$

$-3 \quad -3$

$x = -3$

$x - 6 = 0$

$+6 \quad +6$

$x = 6$

$(-3+3)(6-6)$

$0 \cdot 0$

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Try a couple

$$(x + 4)(x - 2) = 0$$

$x + 4 = 0$ $\quad$ $x - 2 = 0$

$-4 \quad -4$ $\quad$ $+2 \quad +2$

$x = -4$ $\quad$ $x = 2$

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

$x - 5 = 0$ $\quad$ $x + 3 = 0$

$+5 \quad +5$ $\quad$ $-3 \quad -3$

$x = 5$ $\quad$ $x = -3$

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But, they don't all begin factored

$x^2 + 3x - 10 = 0$

-1 +10
+1 -10
-5 +2
+5 -2

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

$x+5=0$ $\quad x-2=0$

$-5\ -5 \quad +2\ +2$

$x=-5 \quad x=2$

$m^2 + 5m - 84 = 0$

$(m+12)(m-7)=0$

$m+12=0 \quad m-7=0$

$-12\ -12 \quad +7\ +7$

$m=-12 \quad m=7$

$\frac{2x^2}{2} - \frac{20x}{2} + \frac{50}{2} = 0$

$2(x^2-10x+25)$

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

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

$x-5=0$

$+5\ +5$

$x=5$

$y^2 + 9y + 20 = 0$

$(y+5)(y+4)=0$

$y+5=0 \quad y+4=0$

$-5\ -5 \quad -4\ -4$

$y=-5 \quad y=-4$

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What if a term is missing?

$x^2 - 25 = 0$

$-125 \quad +25$

$\sqrt{x^2} = \sqrt{25}$

$x = \pm 5$

$x = +5 \quad x = -5$

$x^2 + 0x - 25 = 0$

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

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

$x = 5 \quad x = -5$

$x^2 + 3x = 0$

$x(x + 3) = 0$

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

$-3 \quad -3$

$x = -3$

$x^2 + 3x + 0 = 0$

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

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

$-0 \quad -0 \quad -3 \quad -3$

$x = 0 \quad x = -3$

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What if they don't factor at all?

$x^2 + 10x - 8 = 0$

$ax^2 + bx + c = 0$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$a = 1$

$b = 10$

$c = -8$

$$x = \frac{-10 \pm \sqrt{10^2 - 4 \cdot 1 \cdot -8}}{2 \cdot 1}$$

$$= \frac{-10 \pm \sqrt{100 + 32}}{2}$$

$$= \frac{-10 \pm \sqrt{132}}{2}$$

$$\frac{-10 + 11.489}{2} = \frac{1.489}{2} = 0.7445$$

$$\frac{-10 - 11.489}{2} = \frac{-21.489}{2} = -10.7445$$

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Try it yourself

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

$a = 2$

$b = 3$

$c = 5$

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 2 \cdot 5}}{2 \cdot 2}$$

$$= \frac{-3 \pm \sqrt{9 - 40}}{4}$$

$$= \frac{-3 \pm \sqrt{-31}}{4}$$

→ no real solution

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Practice

Which of the following equations could represent f ?

A) $f(x) = x^2 - 4$

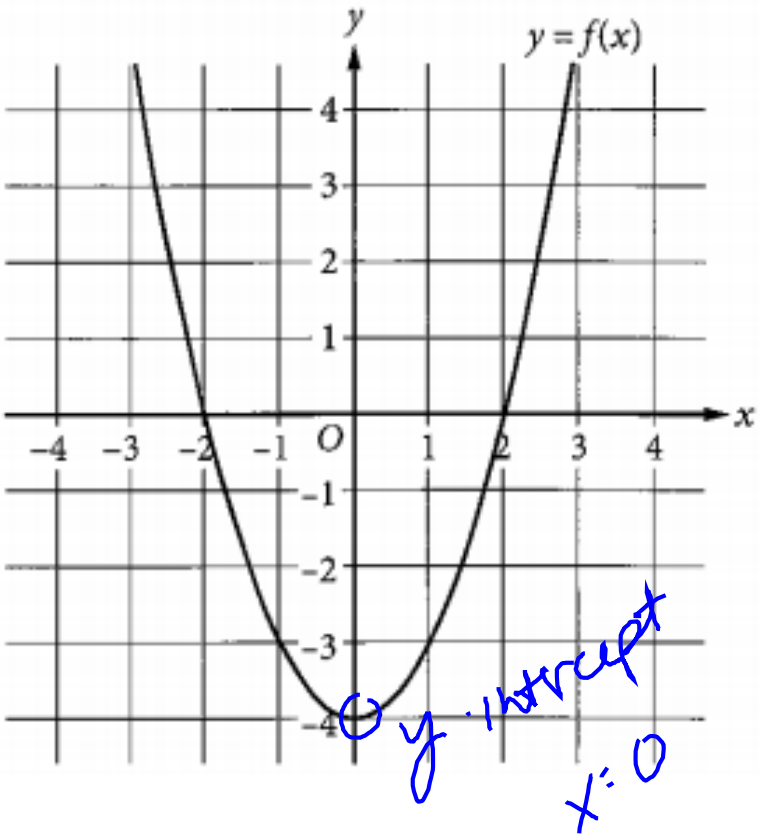
B) $f(x) = x^2 - 2$

C) $f(x) = x^2 + 2$

D) $f(x) = x^2 + 4$

$0^2 - 4$

-4



Exit Slip

- Choose an answer
- Explain your reasoning (show your process).
- Choose an incorrect answer, explain the mistake someone who chose that one made.