Algebra 1 | Monday 4-29-13 | Class Notes

Ch. 8-9 The Quadratic Formula and the Discriminant

- Derivation of the Quadratic Formula
  ↓
  where it comes from
- Meaning of the Discriminant
- Practice!

$\frac{ax^2}{a} + \frac{bx}{a} + \frac{c}{a} = 0$ Complete the Square

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$

$-\frac{c}{a}$ $-\frac{c}{a}$

COMMON DENOMINATOR

$x^2 + \frac{b}{a}x + \left\{\left(\frac{b}{2a}\right)^2\right\} = -\frac{c}{a}\cdot\frac{4a}{4a} + \left\{\frac{b^2}{4a^2}\right\}$

$\left(x + \frac{b}{2a}\right)^2 = -\frac{4ac}{4a^2} + \frac{b^2}{4a^2}$

$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$ TAKE $\sqrt{}$ OF BOTH SIDES

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

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

$-\frac{b}{2a}$ $-\frac{b}{2a}$

They have a com. denom!

"THE" QUADRATIC FORMULA

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

PANCAKE MIX or

$$x = \frac{-b \pm \sqrt{d}}{2a}$$

d = discriminant
$d = b^2 - 4ac$

{COMPLETING THE SQUARE IS LIKE MAKING PANCAKES FROM SCRATCH!}

Worksheet Practice

① $5x^2 = 3x + 15$

$5x^2 - 3x - 15 = 0$ SF ✓

$a = 5$

$b = -3$

$c = -15$

$b^2 - 4ac$

$(-3)^2 - 4(5)(-15)$

$9 + 300 = 309 = d$

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{3 \pm \sqrt{309}}{10}$$

Simplify $\sqrt{309}$

③ 103

$$x = \left\{ \frac{3+\sqrt{309}}{10}, \frac{3-\sqrt{309}}{10} \right\}$$

② $11x^2 + 4 = 12x$

$11x^2 - 12x + 4 = 0$

$a = 11$

$b = -12$

$c = 4$

$b^2 - 4ac$

$(-12)^2 - 4(11)(4)$

$144 - 176 = -32 = d$

No Real Solution