Warm Up

1. Use completing the square to find the vertex for

$$y = -3x^2 - 18x - 31$$

(-3, -4)

2. Given a double root at -3, find the general form equation for the polynomial that goes through the point (3, 72).

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

3. Solve $0 = 36x^2 - 36x - 71$

$$X = \frac{36 \pm \sqrt{11520}}{72}$$

Homework Solutions:

1. $9x^2 - 24x + 16 = 0$

$$x = \frac{4}{3}$$

2. $x^2 + 5x = -8$

$$x = \frac{-5 \pm \sqrt{-8}}{2}$$

3. $y - 7 = -\frac{1}{4}(x + 2)^2$

Vertex: (-2, 7)

Focus: (-2, 6)

Directrix: y = 8

PRACTICE USING THE QUADRATIC FORMULA

$1)\ 0 = 2x^2 - 5x - 8$

Solve for x.

$$\mathbf{X = \frac{5 \pm \sqrt{89}}{4}}$$

What can the discriminant tell us about our roots??

$b^2 - 4ac > 0$

2 real number roots

$b^2 - 4ac = 0$

1 real root

(double roots)

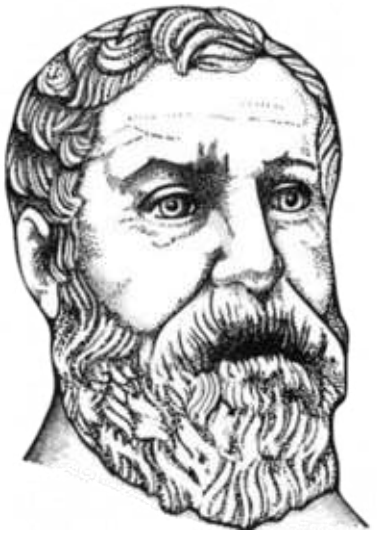
$b^2 - 4ac < 0$

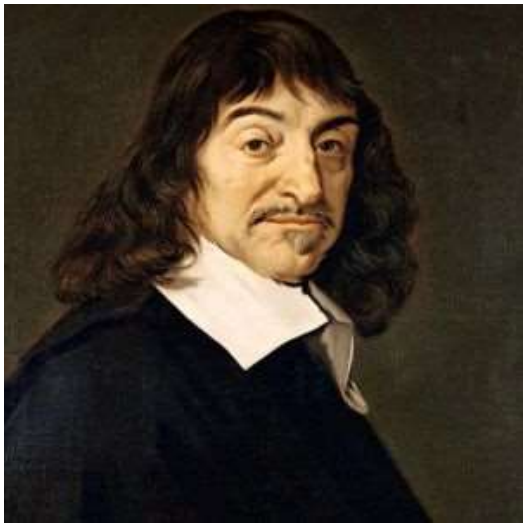
2 imaginary roots

If the discriminant is less than zero, we say there are no real number solutions.
BUT…a number system was created called

THE COMPLEX NUMBER SYSTEM.

Heron of Alexandria, 1st AD
Imaginary unit was coined by Rene Descartes





$$i = \sqrt{-1}$$

$$\sqrt{-4} = 2i$$

$$\sqrt{-32} =$$

$$i\sqrt{32}$$

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