Warm-Up

1. What is the quadratic formula? $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ "2"

2. When do we use the quadtratic formula? Solving . . . x^2 quadratics

3. When solving a quadratic, the equation must be in Standard form, which means it is equal to 0

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

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

$a=1, b=4, c=-5$

$x = \frac{-4 \pm \sqrt{16-4(1)(-5)}}{2(1)} = \frac{-4 \pm \sqrt{36}}{2} = \frac{-4 \pm 6}{2}$

$\frac{-4+6}{2} = \frac{2}{2} = 1$ $\quad \frac{-4-6}{2} = \frac{-10}{2} = -5$

Algebra 9-6 Analyzing Solutions to Quadratic Equations

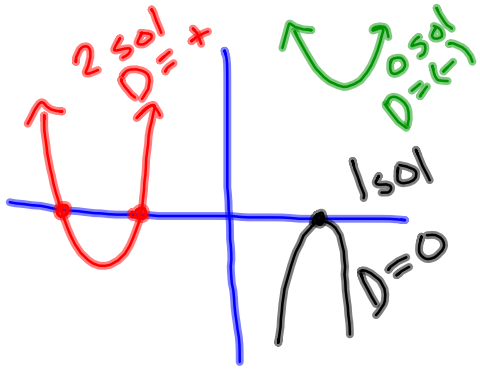
The **discriminant** is used to determine the # of solutions.

Discriminant = $b^2 - 4ac$

Positive 2 solutions

Negative 0 solutions

Zero 1 solution



Examples

3. **How many** real solutions does the equation $25x^2-10x+1=0$ have? 1 solution

$a=25, b=-10, c=1$

$b^2-4ac = 100-4(25)(1)$

$= 100-100 = 0$

4. **How many** real solutions does the equation $x^2+4=-6x$ have ? 2 solutions

$x^2+6x+4=0$

$a=1, b=6, c=4$

$b^2-4ac = 36-4(1)(4)$

$= 36-16 = 20$

5. **How many** real solutions does the equation $3x^2+5x+7=0$ have? No Solutions $\emptyset$

$a=3\ b=5\ c=7$

$b^2-4ac = 25-4(3)(7)$

$= 25-84 = -59$

6. **How many** real solutions does the equation $x^2+38=0$ have? No Sol., $\emptyset$, 0 Sol.

$a=1, b=0, c=38$

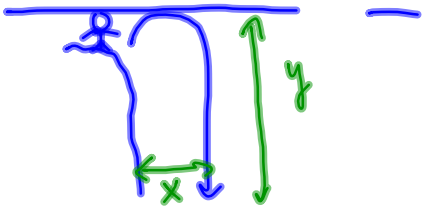
$b^2-4ac = 0-4(1)(38)$

$= 0-152$

$= -152$

Back to the diver from yesterday...

1. The formula $y = -x^2 + 2x + 27$ represents a diver diving, where y is the meters above water and x is the meters away from the cliff.



y = meters above H_2O

x = meters away from cliff

Will the diver reach a height of...

1. 27.5 meters? yes Why or why not? He starts at 27 m

when $x=0$, $-(0)^2+2(0)+27=27$

2. 28 meters? yes Why or why not? There's a solution

$y=28$

$28=-x^2+2x+27$

$0=-x^2+2x-1$

$b^2-4ac = 4-4(-1)(-1) = 4-4=0$

3. 29 meters? NO Why or why not? Nope since 28 is the highest point

$29=-x^2+2x+27$

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

$a=-1, b=2, c=-2$

$b^2-4ac = 4-4(-1)(-2)$

$= 4-8$

$= -4$

Assignment: 9-6 #'s 7 – 16