Solve.

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

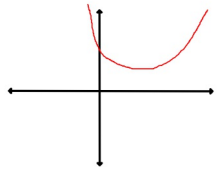
$$2x^2 - 5x + 13 = 0$$

$b^2 - 4ac = -79$

NO Real Sol's

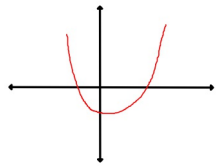
$$2x^2 - 5x + 13 = 0$$

No Real Solutions
because there are no real square roots
of a negative number.



$$4x^2 + 9x - 6 = 0$$

Two Real Solutions
because there are two square roots of
of every positive number.



Are there any other possible outcomes?

Solve using the Quadratic Formula

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

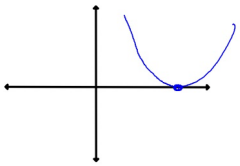
$$36x^2 - 84x + 49 = 0$$

$b^2 - 4ac = 0$

$\frac{84 \pm \sqrt{0}}{72}$ ONE Real Sol

$$36x^2 - 84x + 49 = 0$$

One Real Solution
because there is only one square root
of zero.



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

What part of the Quadratic Formula determines if there are Real solutions or not?

The DISCRIMINANT → $b^2 - 4ac$

Depending on the value of the DISCRIMINANT you can determine how many and what kind of solutions there will be.

- 2 Real Solutions
- 1 Real Solution
- 0 Real Solutions = 2 Imaginary Solutions

Discriminant	# and kind of solutions
$b^2 - 4ac > 0$	2 Real Solutions
$b^2 - 4ac = 0$	1 Real Solution
$b^2 - 4ac < 0$	0 Real Solutions or 2 Imaginary Solutions

You can FINISH Hwk #20

Pages 293-294

Problems 8, 9, 21-24, 31-33, 57-59

Due Tomorrow

For each quadratic equation tell the number and what type of solutions there are.

1. $4x^2 + 9x - 3 = 0$
   $b^2 - 4ac = 129$
   2 real
2. $18x^2 - 12x + 2 = 0$
   $b^2 - 4ac = 144 - 4(18)(2) = 0$
   1 real
3. $3x^2 + 7x - 10 = 0$
   $b^2 - 4ac = 169$
   2 real
4. $-x^2 - 13x + 8 = 0$
   $b^2 - 4ac = 201$
   2 real
5. $5x^2 - 7x + 9 = 0$
   $b^2 - 4ac = -131$
   No Real or 2 imag

An object is shot into the air. The following equation gives the height of the object as a function of time.

$h(t) = -16t^2 + 75t + 30$

1. Will the object reach a height of 100 feet?

Yes $100 = -16t^2 + 75t + 30$

$0 = -16t^2 + 75t - 70$

$b^2 - 4ac$

$75^2 - 4(-16)(-70)$

$= 1145$

2. Will the object reach a height of 120 feet?

NO $120 = -16t^2 + 75t + 30$

$0 = -16t^2 + 75t - 90$

$b^2 - 4ac = -135$

Find the coordinates of the Vertex: $y = (x + 5)^2 - 4$

$(-5, -4)$

Solve using square roots: $0 = (x + 5)^2 - 4$

$+4 \quad +4$

$\pm 2 = x + 5$

$\sqrt{4} = \sqrt{(x+5)^2}$

$x = -3, -7$

Some things are easier if the equation is in Vertex Form

$(x+6)^2 =$ ____

$(x-4)^2 =$ ____

$(x+11)^2 =$ ____

$(\quad)^2 = x^2 - 14x + 49$

$(\quad)^2 = x^2 + 16x + 64$

$(\quad)^2 = x^2 - 10x + 25$

$(x+6)^2 = x^2 + 12x + 36$

$(x-4)^2 = x^2 - 8x + 16$

$(x+11)^2 = x^2 + 22x + 121$

$(x-7)^2 = x^2 - 14x + 49$

$(x+8)^2 = x^2 + 16x + 64$

$(x-5)^2 = x^2 - 10x + 25$