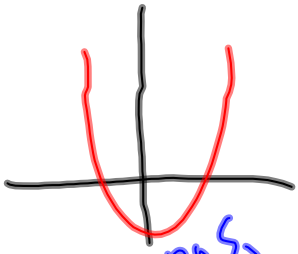
10.7 Interpret the Discriminant

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

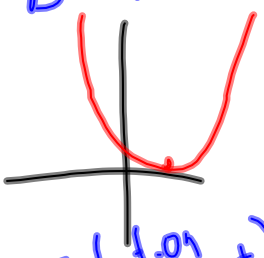
→ The Discriminant b^2-4ac

$b^2-4ac>0$



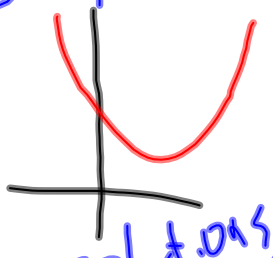
2 solutions (x intercepts)

$b^2-4ac=0$



1 solution (x-intercept)

$b^2-4ac<0$



no solutions (x-intercepts)

Tell whether the equation has *two solutions*, *one solution*, or *no solution*. b^2-4ac

1. $x^2 + 4x + 3 = 0$

$4^2-4(1)(3)$

$16-12>0$

2 solutions

2. $2x^2 - 5x + 6 = 0$

$(-5)^2-4(2)(6)$

$25-48<0$

no solutions

3. $-x^2 + 2x = 1$

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

$2^2-4(-1)(-1)$

$4-4=0$

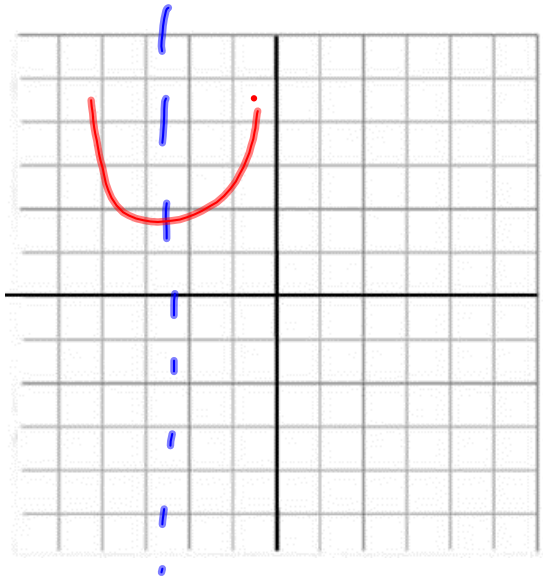
1 solution

Find the number of x-intercepts of the graph of $y = x^2 + 5x + 8$.

Then graph the equation

no solutions

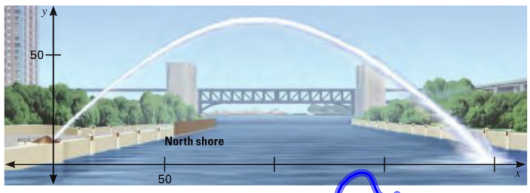
$X = -5/2$



Find the number of x-intercepts of the graph of the function.

4. $y = x^2 + 10x + 25$ **5.** $y = x^2 - 9x$ **6.** $y = -x^2 + 2x - 4$

FOUNTAINS The Centennial Fountain in Chicago shoots a water arc that can be modeled by the graph of the equation $y = -0.006x^2 + 1.2x + 10$ where x is the horizontal distance (in feet) from the river's north shore and y is the height (in feet) above the river. Does the water arc reach a height of 50 feet? If so, about how far from the north shore is the water arc 50 feet above the water?



$50 = -0.006x^2 + 1.2x + 10$

$a = -0.006$

$b = 1.2$

$c = -40$

$$\frac{-1.2 \pm \sqrt{(1.2)^2 - 4(-0.006)(-40)}}{2(-0.006)}$$

$$\frac{-1.2 \pm .64}{-.012}$$