

## 20.11 Quadratic Inequalities

$$ax^2 + bx + c < 0$$



$$ax^2 + bx + c > 0$$



$$ax^2 + bx + c \leq 0$$



**Solution Set:**  
 $\{x \mid r1 \leq x \leq r2 \}$

$$ax^2 + bx + c \geq 0$$



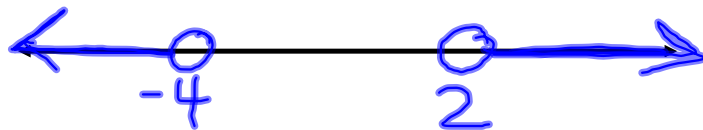
**Solution Set:**  
 $\{x \mid x \leq r1 \text{ OR } x \geq r2 \}$

## 2 EXCEPTIONS:

1. *Imaginary roots: doesn't cross the x-axis*

2. *Equal roots: hits only in one spot*

Graph the solution set of  $x^2 + 2x - 8 > 0$



$$(x+4)(x-2) = 0$$
$$\begin{array}{c|c} x = -4 & x = 2 \end{array}$$

$$\{x \mid x < -4 \text{ or } x > 2\}$$

Graph the solution set of  $x^2 - 4x - 5 < 0$

$$(x-5)(x+1) = 0$$

$$x=5 \quad x=-1$$



$$\{x \mid -1 < x < 5\}$$

What is the solution set for  $x^2 - x - 6 < 0$ ?

A)  $\{x \mid -2 < x < 3\}$

B)  $\{x \mid x < -2 \text{ or } x > 3\}$

C)  $\{x \mid x < -3 \text{ or } x > 2\}$

D)  $\{x \mid -3 < x < 2\}$

$$(x - 3)(x + 2) = 0$$

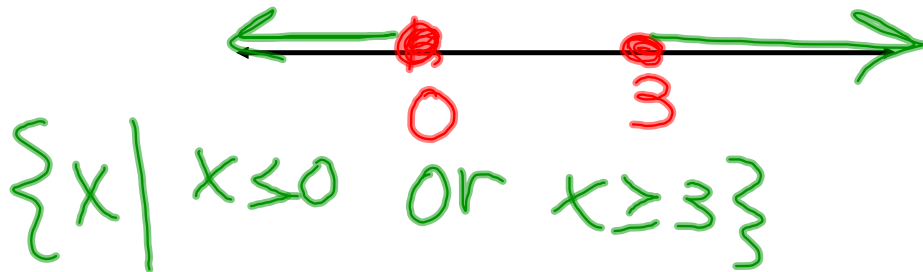
$$x = 3 \quad | \quad x = -2$$

Find and graph the solution set:  $x^2 - 3x \geq 0$

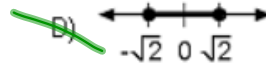
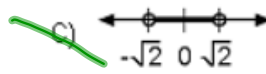
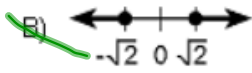
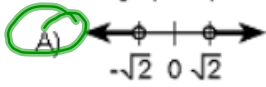
$$x(x-3) \geq 0$$

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$$x=0 \quad | \quad x=3$$



Which graph represents the solution set of  $x^2 - 2 > 0$ ?



$$\begin{aligned}x^2 - 2 &> 0 \\+2 & \quad +2 \\ \hline \sqrt{x^2} &> \sqrt{2} \\ x &> \pm \sqrt{2}\end{aligned}$$

**Homework: pg 970 #1-7, 8, 10, 13, 15, 19**

**Show all work for full credit!**

