

Name: \_\_\_\_\_

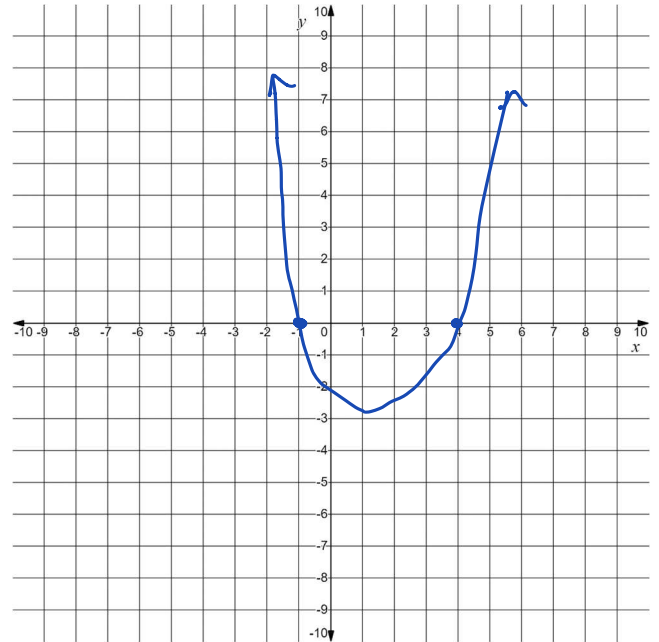
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<b>Learning Goal 9.2</b>	Solving quadratic inequalities.
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**Example** Solve  $x^2 - 3x - 4 > 0$ .

**Method 1**  
**Graphing**

Factor!  
 $\frac{-4}{-4} \times \frac{1}{1} = -4$   
 $\frac{-4}{-4} + \frac{1}{1} = -3$   
 $(x-4)(x+1) > 0$   
 $\downarrow$                        $\downarrow$   
 $x=4$                        $x=-1$



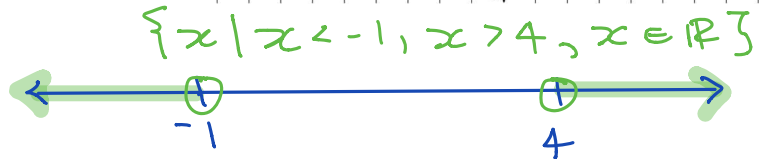
$\{x \mid x < -1, x > 4, x \in \mathbb{R}\}$

state the variable

**Method 2**

**Roots and Test Points**

Factor  
 $(x-4)(x+1) > 0$   
 $\downarrow$                        $\downarrow$   
 $x=4$                        $x=-1$



$\{x \mid x < -1, x > 4, x \in \mathbb{R}\}$

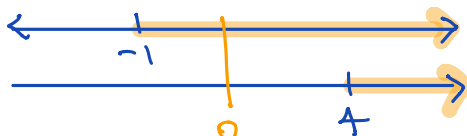
TP. -2                      0                      5  
 $(-2)^2 - 3(-2) - 4 > 0$      $(0)^2 - 3(0) - 4 > 0$      $(5)^2 - 3(5) - 4 > 0$   
 $4 + 6 - 4 > 0$                        $0 - 0 - 4 > 0$                        $25 - 15 - 4 > 0$   
 $6 > 0$                                        $-4 > 0$                                        $6 > 0$

**Method 3**

**Case Analysis**

Factor! Again  
 $(x-4)(x+1) > 0$   
 $\downarrow$                        $\downarrow$   
 $x=4$                        $x=-1$

case 1: Both are positive

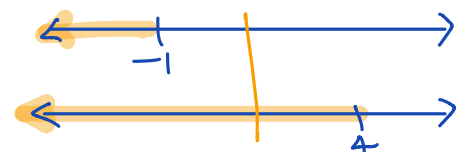


$x > 4$

$\{x \mid x > 4, x < -1, x \in \mathbb{R}\}$

$x - 4 < 0$                        $x + 1 < 0$

case 2: Both are negative



$x < -1$

Assignment

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Quiz Next Day!

~~$-1 > x < 4$~~

**Example** Solve  $-6x^2 - x + 7 \leq 0$ .

**Method 1**  
**Graphing**

$$\frac{-(6x^2 + x - 7)}{-1} \leq \frac{0}{-1}$$

$$\frac{7}{7} \times \frac{-6}{-6} = -42$$

$$\frac{7}{7} + \frac{-6}{-6} = 1$$

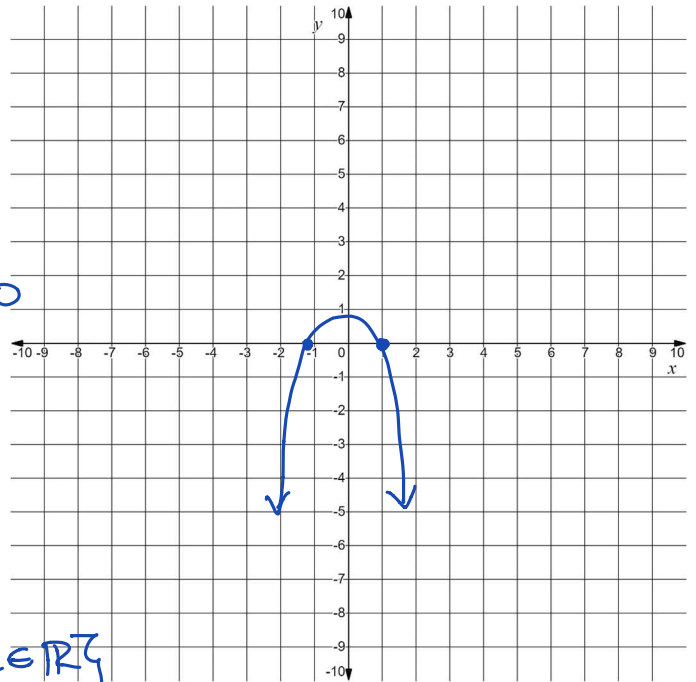
$$6x^2 + x - 7 \geq 0$$

$$6x^2 + 7x - 6x - 7 \geq 0$$

$$x(6x + 7) - (6x + 7) \geq 0$$

$$(6x + 7)(x - 1)$$

$$x = -\frac{7}{6} \quad x = 1$$

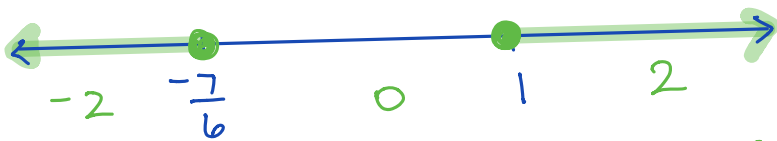


**Method 2**

**Roots and Test Points**

$$\left\{ x \mid x \leq -\frac{7}{6}, x \geq 1, x \in \mathbb{R} \right\}$$

$$-6x^2 - x + 7 \leq 0$$



$$\left\{ x \mid x \leq -\frac{7}{6}, x \geq 1, x \in \mathbb{R} \right\}$$

$$-6(-2)^2 - (-2) + 7$$

$$-6(4) + 2 + 7$$

$$-24 + 2 + 7$$

$$-15 \leq 0$$

$$-6(0)^2 - (0) + 7$$

$$0 - 0 + 7$$

$$7 \leq 0$$

$$-6(2)^2 - (2) + 7$$

$$-6(4) - 2 + 7$$

$$-24 - 2 + 7$$

$$-19 \leq 0$$

**Method 3**

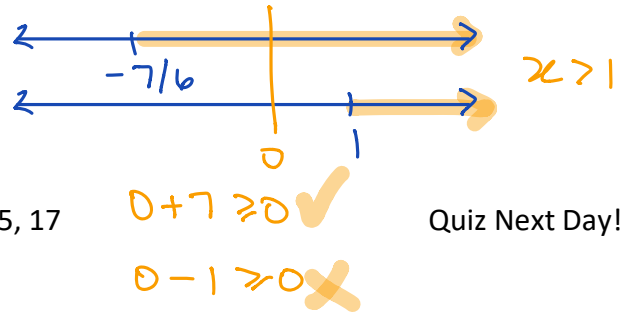
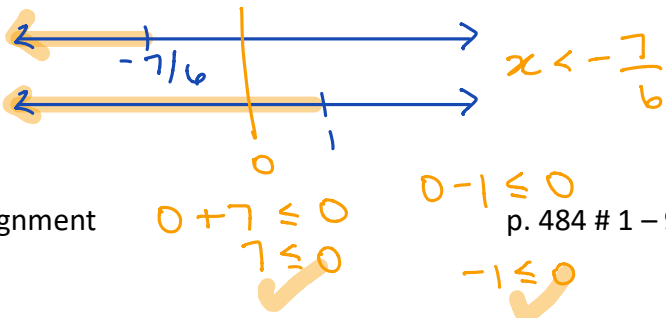
**Case Analysis**

$$\frac{-(6x+7)(x-1)}{- \quad + \quad +} \leq 0$$

$$\left\{ x \mid x < -\frac{7}{6}, x > 1, x \in \mathbb{R} \right\}$$

Case 1: Both are -ve

Case 2: Both are +ve



Assignment

$$0 + 7 \leq 0$$

$$7 \leq 0$$

$$0 - 1 \leq 0$$

$$-1 \leq 0$$

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$$0 + 7 \geq 0$$

$$0 - 1 \geq 0$$

Quiz Next Day!