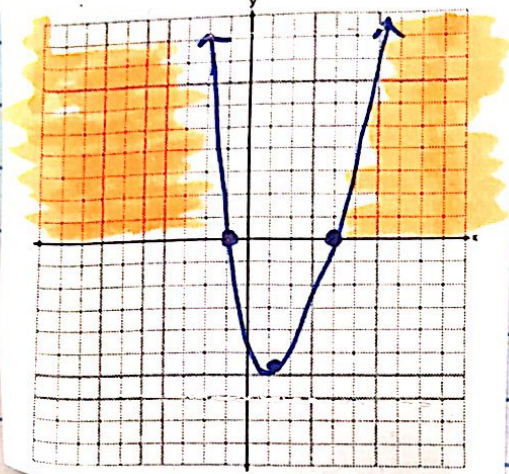


Quadratic Inequalities

$$x^2 - 3x - 4 > 4$$



$$x^2 - 3x - 4 > 0$$

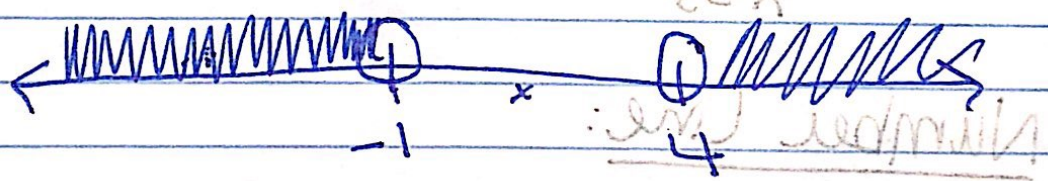
Set one side = 0

Factor / Find Intercepts:

$$0 = (x-4)(x+1) = 0$$

$$x = 4, x = -1$$

Number Line

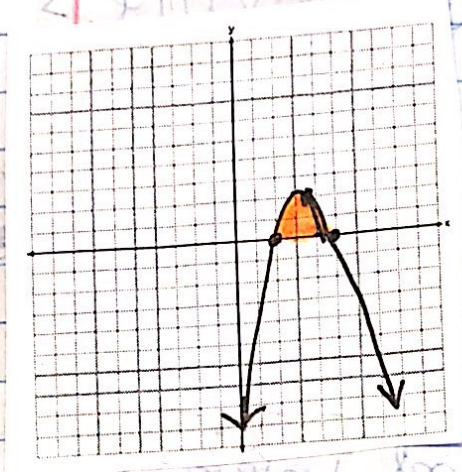


Test Pts.: $f(-2) = 6$ $f(0) = -4$ $f(5) = 6$

Solution:

$$x < -1 \quad \text{OR} \quad x > 4$$

Use our OARs



$$-x^2 + 7x - 10 > 0$$

$$x - (x^2 - 7x + 10) \geq 0$$

| | | |
|-----------|--------------|--------------------------|
| $+(-7)$ | x | 10 |
| $-5 + -2$ | \checkmark | $-5 \cdot -2 \checkmark$ |

Factor:

$$-(x-5)(x-2) = 0$$

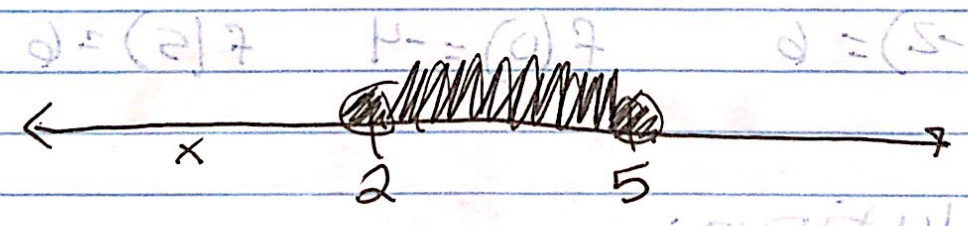
$$x = 5 \quad x = 2$$

$$x - 5 = 0$$

$$+5 \quad +5$$

$$x = 5$$

Number line:



Test
pts

$$f(1) = -4 \quad f(3) = 2 \quad f(6) = -4$$

Solution:

$$x > 2 \text{ AND } x < 5$$

43

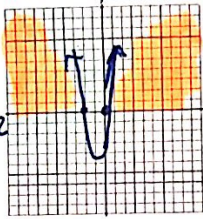
* SANDWICH

Quadratic Inequalities

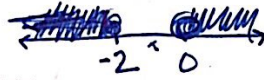
Directions: Solve the following quadratic inequalities.

a) $x^2 + 2x \geq 0$
Solve for the x-intercepts:
(where the function = 0)

Sketch:



Number line:



Solutions:

$$x < -2 \text{ OR } x > 0$$

$$x(x+2) \geq 0$$

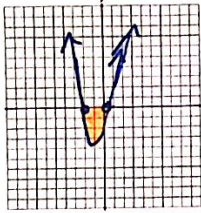
$$x=0 \quad x+2=0$$

$$-2 \quad -2 \quad x=-2$$

$$(0,0), (-2,0)$$

b) $x^2 + 2x \leq 0$
Solve for the x-intercepts:
(where the function = 0)

Sketch:



Number line:



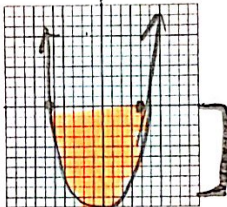
Solutions:

$$x \geq -2 \text{ AND } x \leq 0$$

$$(0,0), (-2,0)$$

c) $x^2 + 2x - 24 < 0$
Solve for the x-intercepts:
(where the function = 0)

Sketch:



Number line:



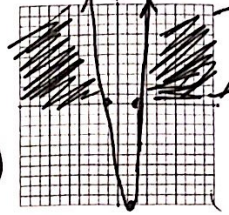
Solutions:

$$x > -6 \text{ AND } x < 4$$

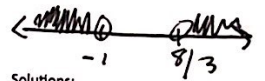
$$(-6,0), (4,0)$$

d. $3x^2 - 5x > 8$
Solve for the x-intercepts:
(where the function = 0)

Sketch:



Number line:



Solutions:

$$x < -1 \text{ OR } x > 8/3$$

$$(-1,0), (8/3,0)$$

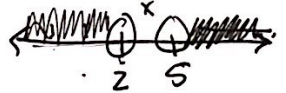
e. $-x^2 + 7x - 10 < 0$ (Stop! Will this open up or down? Why?)

Solve for the x-intercepts:
(where the function = 0)

Sketch:



Number line:



Solutions:

$$x < 2 \text{ OR } x > 5$$

$$(5,0), (2,0)$$

$$-(x^2 - 7x + 10) < 0$$

$$-(x - 5)(x - 2) \leq 0$$

$$\begin{array}{r|l} -7 & 10 \\ -5+2 & -5 \cdot 2 \end{array}$$

$$x - 5 = 0$$

$$x = 5$$

$$x - 2 = 0$$

$$x = 2$$