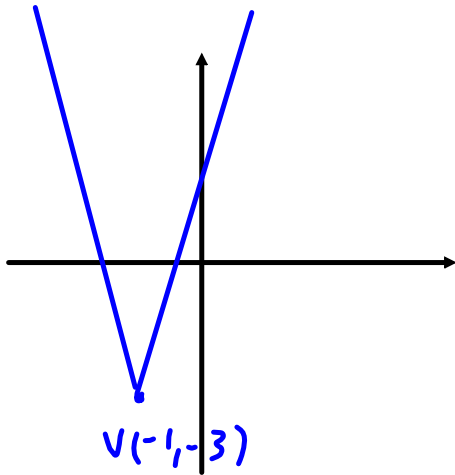


1.3

$$\#1.a) f(x) = 5|x+1| - 3$$



Left branch: $y = -5x + b$

$$V(-1, -3) \quad -3 = -5(-1) + b$$

$$-3 = 5 + b$$

$$-8 = b$$

$$y = -5x - 8$$

Right branch: $y = 5x + b$

$$V(-1, -3) \quad -3 = 5(-1) + b$$

$$-3 = -5 + b$$

$$2 = b$$

$$y = 5x + 2$$

Piece-wise function:

$$f(x) = \begin{cases} -5x - 8 & \text{if } x < -1 \\ 5x + 2 & \text{if } x \geq -1 \end{cases}$$

↑
rules

↑
domains

$$3.a) -4|x+3|+1 \leq 0$$

Test point method:

$$-4|x+3|+1 = 0$$

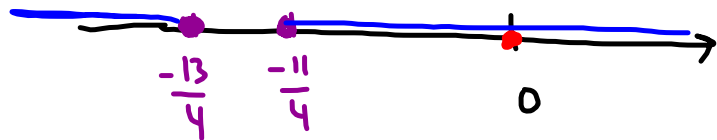
$$-4|x+3| = -1$$

$$|x+3| = \frac{1}{4}$$

$$-(x+3) = \frac{1}{4} \quad x+3 = \frac{1}{4}$$

$$x+3 = -\frac{1}{4} \quad x = -\frac{11}{4}$$

$$x = \frac{-13}{4}$$



test $x=0$

$$-4|0+3|+1 \leq 0$$

$$-4|3|+1 \leq 0$$

$$-12+1 \leq 0$$

$$-11 \leq 0 \quad \checkmark$$

$$x :]-\infty, \frac{-13}{4}] \cup [\frac{-11}{4}, +\infty[$$

$$3. a) \quad -4|x+3|+1 \leq 0$$

Algebraic inequality solution:

$$-4|x+3|+1 \leq 0$$

$$-4|x+3| \leq -1$$

$$|x+3| \geq \frac{1}{4}$$

$$\text{if } x+3 \geq 0$$

$$\underline{x \geq -3}$$

then

$$x+3 \geq \frac{1}{4}$$

$$x \geq -\frac{11}{4} \checkmark$$

$$\text{if } x+3 < 0$$

$$\underline{x < -3}$$

$$\text{then } -(x+3) \geq \frac{1}{4}$$

$$x+3 \leq -\frac{1}{4}$$

$$x \leq -\frac{13}{4} \checkmark$$

$$x: \left] -\infty, -\frac{13}{4} \right] \cup \left[-\frac{11}{4}, \infty \right[$$