

Solving Inequalities

Goal:

- to solve inequalities with square roots

Homework: p.39 #5,13,14

$$4\sqrt{x-3} + 1 \geq 13$$

$$\text{domain: } x - 3 \geq 0$$

$$x \geq 3$$

① Solve the equation

$$4\sqrt{x-3} + 1 = 13$$

$$4\sqrt{x-3} = 12$$

$$\sqrt{x-3} = 3$$

$$x - 3 = 9$$

$$x = 12$$

② Test a point

Intervals $x: [3, 12[$ or $]12, \infty[$

$$x = 3$$

$$4\sqrt{3-3} + 1$$

$$= 4\sqrt{0} + 1$$

$$= 1 \quad \text{since this is less than 13 so is}$$

the entire interval $[3, 12[$.

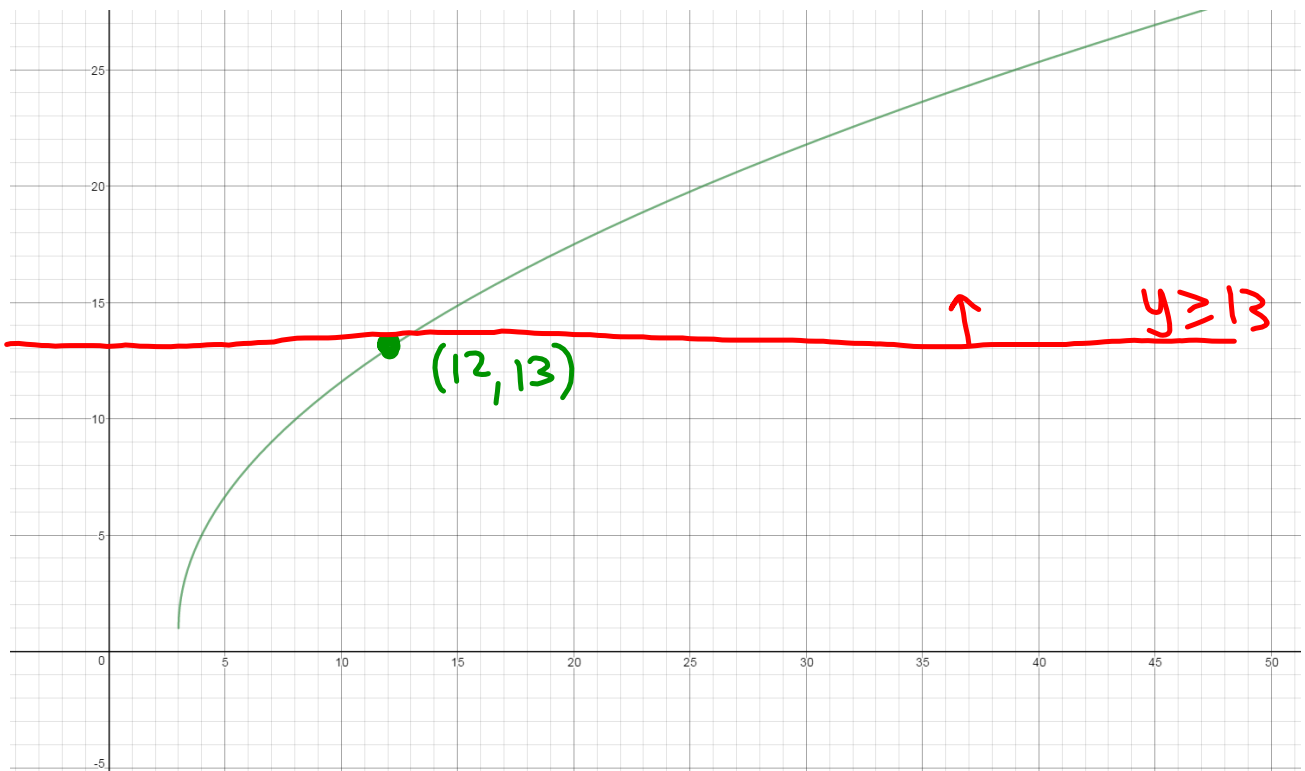
③ state solution

$$x: [12, \infty[$$

OR

$$x \geq 12$$

Graphical solution



$$4\sqrt{x-3} + 1 \leq 13$$

$$\text{domain: } x-3 \geq 0$$

$$x \geq 3$$

$$4\sqrt{x-3} \leq 12$$

① solve the inequality

$$\sqrt{x-3} \leq 3$$

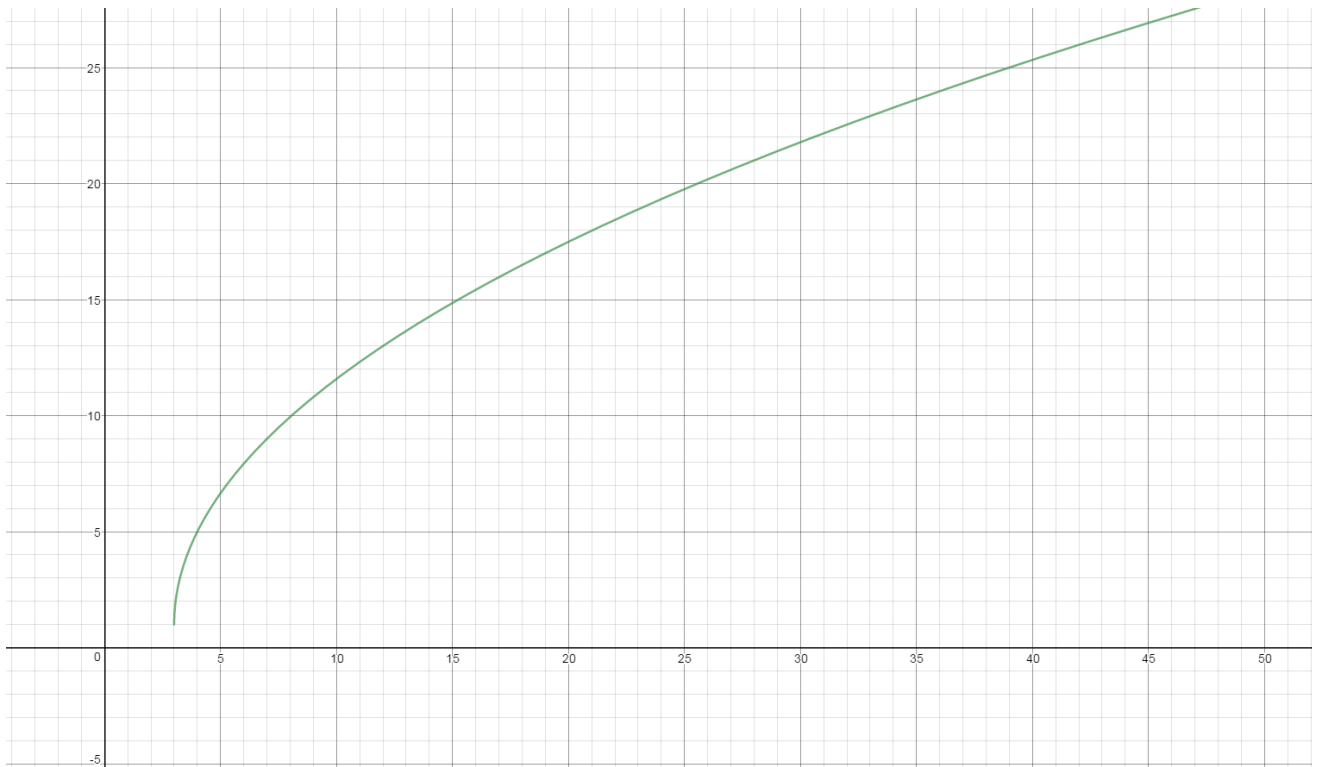
$$x-3 \leq 9$$

$$x \leq 12$$

② Compare with domain

$$3 \leq x \leq 12$$

Graphical solution



$$5. c) -0.5\sqrt{-11(x+3)} - 7 < 14$$

$$-0.5\sqrt{-11(x+3)} < 21$$

$$\sqrt{-11(x+3)} > -42$$

dom:

$$-11(x+3) \geq 0$$

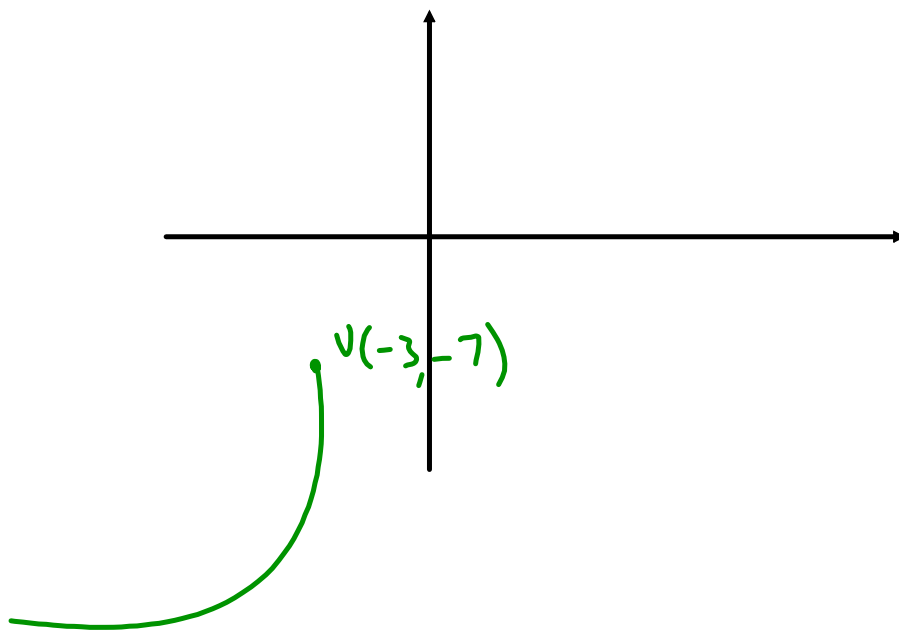
$$x+3 \leq 0$$

$$x \leq -3$$

true for every value of x in domain.

Therefore, solution is the domain.

$$x \leq -3$$



$$-2\sqrt{4x+8} - 1 < 3$$