

Quiz 7

1. Solve for x :

a) $|2x + 6| = 4$

b) $\sqrt{2x + 6} - 2 = 0$

Answer. a) First, get rid of the absolute value bars by making two equations. The first is $(2x + 6) = 4$, which gives $2x = -2$ and so $x = -1$.

The second is $-(2x + 6) = 4$ which gives $-2x - 6 = 4$, and so $-2x = 10 \rightarrow x = -5$. You can check both of these by plugging them back in to the original equation.

b) First, move the 2 over and square both sides. This gives

$$\sqrt{2x + 6} = 2 \rightarrow \sqrt{2x + 6}^2 = 2^2$$

$$2x + 6 = 4$$

$$2x = -2$$

$$x = -1$$

Now, *plug this back in to make sure it works!* (it does).

□

2. Solve for x , express your answer in interval notation:

a) $x - 1 \geq 0$ OR $-2x + 3 \geq 5$

b) $4x - 4 < 8$ AND $-3x - 3 \leq 0$

Answer. a) Solve each piece for x , and you should get

$$x \geq 1 \text{ OR } x \leq -1.$$

Or means union, so drawing these out on a number line and combining them leads to

$$(-\infty, -1] \cup [1, \infty).$$

b) Solve each piece for x , and get

$$x < 3 \text{ AND } x \geq -1.$$

And means intersection, so drawing these out on numberlines and looking at what they have in common leads to

$$[-1, 3).$$

□

3. True or False?

a) $|3x + 1| \leq 0$ has no solutions

b) $\sqrt{5x - 1} = -3$ has no solutions

Answer. a) False. $x = -1/3$ is a solution (and is the only solution).

b) True. Solving gives $x = 2$, but plugging this in doesn't work.

□