Topic: Absolute value inequalities

Question: Graph the inequality.

$$2\,|\,x-1\,|\,+3>9$$

Answer choices:

A

B

C

D

Solution: B

Isolate the absolute value expression on the left side of the inequality.

$$2|x-1|+3>9$$

$$2|x-1|>6$$

$$|x-1|>3$$

Since $3>0$, taking away the absolute value sign, we get

$$x-1>3 \quad \text{or} \quad x-1<-3$$

$$x>4 \quad \text{or} \quad x<-2$$

Then we can graph the disjunction $x>4$ or $x<-2$ as

Topic: Absolute value inequalities

Question: Graph the inequality.

$$3(|2x+1|-2)+2<-1$$

Answer choices:

A No solution

B 

C 

D 

Solution: D

Isolate the absolute value expression on the left side of the inequality.

$$3(|2x+1|-2)+2<-1$$

$$3(|2x+1|-2)<-3$$

$$|2x+1|-2<-1$$

$$|2x+1|<1$$

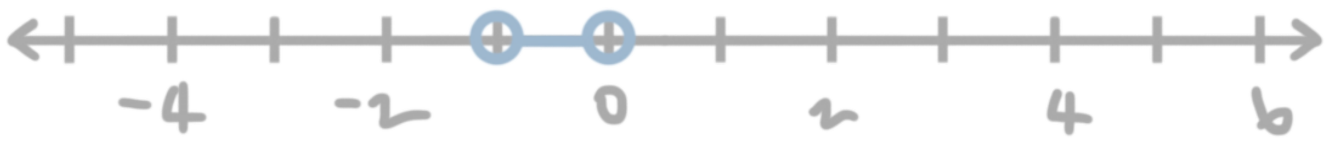
Since $1>0$, taking away the absolute value sign, we get

$$-1<2x+1<1$$

$$-2<2x<0$$

$$-1<x<0$$

Then we can graph the conjunction as



Topic: Absolute value inequalities

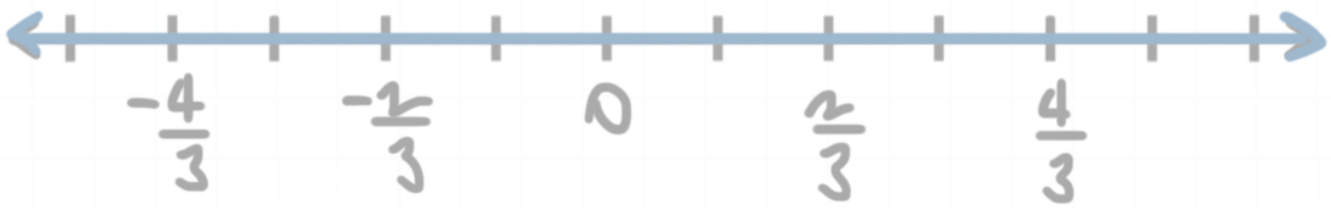
Question: Graph the inequality.

$$2 - |3x - 1| \leq 3$$

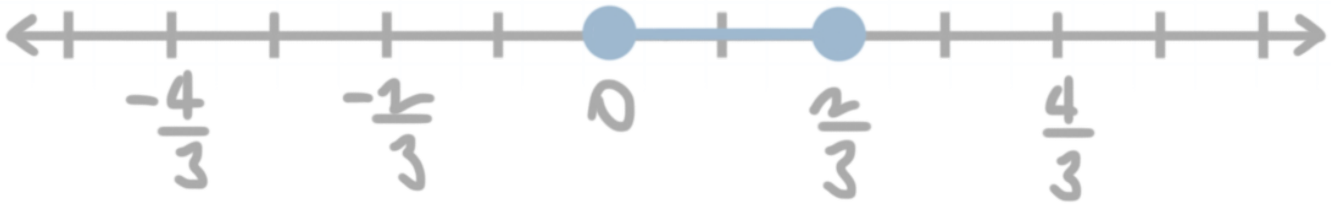
Answer choices:

A No solution

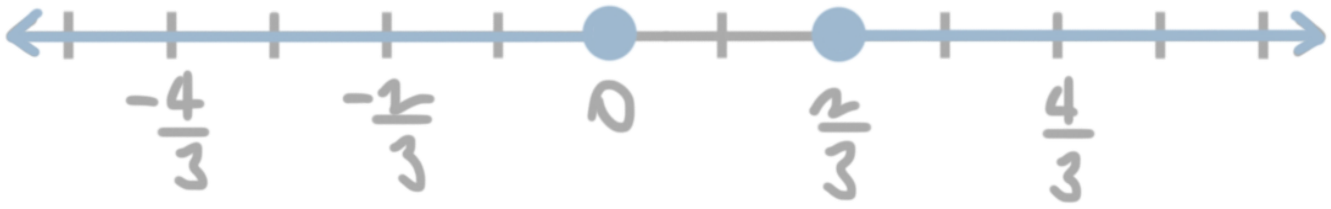
B



C



D



Solution: B

Isolate the absolute value expression on the left side of the inequality.

$$2 - |3x - 1| \leq 3$$

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

$$|3x - 1| \geq -1$$

Because $|3x - 1|$ is always positive, we have an inequality that tells us

positive $\geq$ negative

so the solution is the set of all real numbers, and a sketch of the graph is