

Topic: Absolute value equations**Question:** Solve the equation.

$$|3x - 2| = 5$$

Answer choices:

A $x = -\frac{7}{3}$ or $x = 1$

B $x = \frac{7}{3}$

C $x = \frac{7}{3}$ or $x = -1$

D $x = 1$



Solution: C

We can split the absolute value equation $|3x - 2| = 5$ into two related equations.

$$3x - 2 = 5$$

$$3x - 2 = -5$$

$$3x = 7$$

$$3x = -3$$

$$x = \frac{7}{3}$$

$$x = -1$$

Let's now check each solution by substituting them into the original absolute value equation.

$$|3x - 2| = 5$$

$$|3x - 2| = 5$$

$$\left| 3 \cdot \frac{7}{3} - 2 \right| = 5$$

$$|3(-1) - 2| = 5$$

$$|7 - 2| = 5$$

$$|-3 - 2| = 5$$

$$|5| = 5$$

$$|-5| = 5$$

Both equations are true, so $x = 7/3$ and $x = -1$ are the solutions to the given absolute value equation.



Topic: Absolute value equations**Question:** Solve the equation.

$$|2x| = x + 6$$

Answer choices:

- A $x = -2$
- B $x = 6$
- C $x = 2$ or $x = 6$
- D $x = -2$ or $x = 6$



Solution: D

We can split the absolute value equation $|2x| = x + 6$ into two related equations.

$$2x = x + 6$$

$$x = 6$$

$$2x = -(x + 6)$$

$$2x = -x - 6$$

$$3x = -6$$

$$x = -2$$

Let's now check each solution by substituting them into the original absolute value equation.

$$|2x| = x + 6$$

$$|2(6)| = 6 + 6$$

$$|12| = 12$$

$$|2x| = x + 6$$

$$|2(-2)| = -2 + 6$$

$$|-4| = 4$$

Both equations are true, so $x = 6$ and $x = -2$ are the solutions to the given absolute value equation.



Topic: Absolute value equations**Question:** How many solutions does the equation have?

$$|2x - 12| = 2x$$

Answer choices:

- A 0
- B 1
- C 2
- D 3



Solution: B

We can split the absolute value equation $|2x - 12| = 2x$ into two related equations.

$$2x - 12 = 2x$$

$$-12 = 0$$

No solution

$$2x - 12 = -2x$$

$$4x = 12$$

$$x = 3$$

Let's now check whether $x = 3$ is a solution by substituting it into the original absolute value equation.

$$|2x - 12| = 2x$$

$$|2(3) - 12| = 2(3)$$

$$|6 - 12| = 6$$

$$|-6| = 6$$

The equation is true, so $x = 3$ is the only solution to the given absolute value equation.

