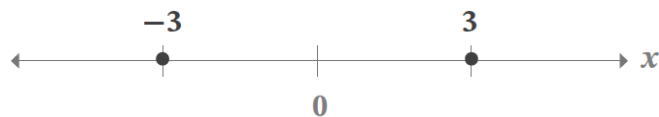


1.

Absolute value means the distance between two points. The result can be positive or negative because the direction does not matter. Therefore, absolute value equations will have a correct solution for both the positive and negative values.

2.

$$\begin{aligned} |3x| &= 9 \\ 3x &= 9 \quad \text{OR} \quad -(3x) = 9 \\ x &= 3 \quad \text{OR} \quad 3x = -9 \\ & \quad \quad \quad \quad x = -3 \end{aligned}$$



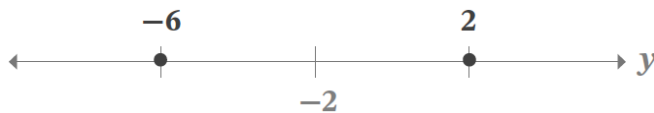
3.

$$\begin{aligned} |m - 3| &= 2 \\ m - 3 &= 2 \quad \text{OR} \quad -(m - 3) = 2 \\ m &= 5 \quad \text{OR} \quad m - 3 = -2 \\ & \quad \quad \quad \quad m = 1 \end{aligned}$$



4.

$$\begin{aligned} -16 &= -4|y + 2| \\ 4 &= |y + 2| \\ 4 &= y + 2 \quad \text{OR} \quad 4 = -(y + 2) \\ y &= 2 \quad \text{OR} \quad -4 = y + 2 \\ & \quad \quad \quad \quad y = -6 \end{aligned}$$



5.

$$\begin{aligned} 9|h - 1| - 5 &= -23 \\ 9|h - 1| &= -18 \\ |h - 1| &= -2 \\ \text{no solution} \end{aligned}$$

6.

$$\begin{aligned} 13|5x + 2| + 7 &= 46 \\ 13|5x + 2| &= 39 \\ |5x + 2| &= 3 \\ 5x + 2 &= 3 \quad \text{OR} \quad -(5x + 2) = 3 \\ 5x &= 1 \quad \text{OR} \quad 5x + 2 = -3 \\ x &= \frac{1}{5} \quad \text{OR} \quad 5x = -5 \\ & \quad \quad \quad \quad x = -1 \end{aligned}$$

two solutions

7.

$$\begin{aligned} |2x - 10 - 3x| + 8 &= 8 \\ |-10 - x| + 8 &= 8 \\ |-10 - x| &= 0 \\ -10 - x &= 0 \quad \text{OR} \quad -(-10 - x) = 0 \\ -x &= 10 \quad \text{OR} \quad 10 + x = 0 \\ x &= -10 \quad \quad \quad x = -10 \end{aligned}$$

one solution

Note: Your student does not need to solve Case 2 if they realize there is only one solution.

8.

a)  $b$  = the drone's battery life

b)  $|b - 20| = 3$

$b - 20 = 3$  OR  $b - 20 = -3$

$b = 23$  OR  $b = 17$

c) The battery life will be between 17 minutes (min) and 23 minutes (max).

9.

$\frac{2}{3}|3x - 9| = 8$

◀ Addition Property of Equality

$|3x - 9| = 12$  OR

◀ Multiplication Property of Equality

$3x - 9 = 12$  OR  $-(3x - 9) = 12$

◀ Definition of Absolute Value

$3x - 9 = -12$

◀ Multiplication Property of Equality

$3x = 21$  OR

$3x = -3$

◀ Addition Property of Equality

$x = 7$  OR

$x = -1$

◀ Multiplication Property of Equality

Note: This question can be solved in more than one way but the solution remains the same regardless of the steps used to solve.

10.

 $d$ : distance

$|d - 55| = 22$

$d - 55 = 22$  OR

$-(d - 55) = 22$

$d - 55 = -22$

$d = 77$  OR

$d = 33$

The minimum distance traveled is 33 miles. The maximum distance traveled is 77 miles.