

WARM-UP

Solve the following multi-step equation for the variable, a :

$$4(2a + 3) = -3(a - 1) + 31$$

$$8a + 12 = -3a + 3 + 31$$

$$8a + 12 = -3a + 34$$

$$+3a \quad +3a$$

$$\hline 11a + 12 = 34$$

$$-12 \quad -12$$

$$\hline 11a = 22$$

$$\hline 11 \quad 11$$

$$\hline a = 2$$

$8a + 12 = -3a + 34$

Sep 24-7:39 AM

Clear Learning Objective

You will be able to solve equations with absolute value.

Sep 24-8:05 AM

$$|13| = 13 \quad |-13| = 13$$

Absolute value – the distance a number is from zero on the number line.

(Note: ALWAYS POSITIVE !)

Sep 24-7:47 AM

$$|x| = 4$$

Because the absolute value bars make ~~it~~ whatever's inside positive, x could actually be positive or negative.

Therefore, when we solve equations with absolute value, we have to include multiple solutions.

$$\{-4, 4\}$$

Sep 24-7:47 AM

$$|x + 5| = 17$$

➤ Based on this equaon, the quantity $(x + 5)$ could equal either 17 or -17.
 ➤ So, we must solve two equaons!

SET-UP #1

$$\begin{array}{r} x + 5 = 17 \\ -5 \quad -5 \\ \hline x = 12 \end{array}$$

SET-UP #2

$$\begin{array}{r} x + 5 = -17 \\ -5 \quad -5 \\ \hline x = -22 \end{array}$$

{-22, 12}

A horizontal number line with arrows at both ends. There are tick marks at -22, 0, and 12. The points -22 and 12 are circled in green. The number 0 is also marked with a vertical line.

Sep 24-7:49 AM

$$|3n - 4| = 1$$

SETUP #1

$$\begin{array}{r} 3n - 4 = 1 \\ +4 \quad +4 \\ \hline 3n = 5 \\ n = 5/3 \end{array}$$

SETUP #2

$$\begin{array}{r} 3n - 4 = -1 \\ +4 \quad +4 \\ \hline 3n = 3 \\ n = 1 \end{array}$$

A horizontal number line with arrows at both ends. There are tick marks at 0, 1/3, 2/3, 1, 4/3, and 5/3. The points 5/3 and 1 are circled in green.

Sep 24-7:50 AM

Example #1: *mid.* *range*
 Ice cream should be stored at 3°F, give or take 5°F. Write and solve an equation to find the maximum and minimum temperatures at which the ice cream should be stored. *unknown*

First, let's map our answer:

Equation Template:
 $\frac{\text{maximum variable}}{\text{middle ideal}} = \frac{\text{distance}}{\text{"give or take"}}$

$|x - 3| = 5$

$x - 3 = 5$ $x - 3 = -5$
 $+3$ $+3$ $+3$ $+3$

$x = 8$ $x = -2$

Sep 24-7:51 AM

EXIT TICKET:

1. Solve for t: $|2t - 4| = 8$

2. The temperature of an enclosure for a pet snake should be about 80°F, give or take 6°F. Write an equation representing the situation, and then find the maximum and minimum temperatures which are acceptable for this habitat.

Sep 24-8:05 AM