Absolute Value Functions

Absolute Value Equations and Inequalities

Solving Absolute Value Equations

For any positive number p and any algebraic expression x:

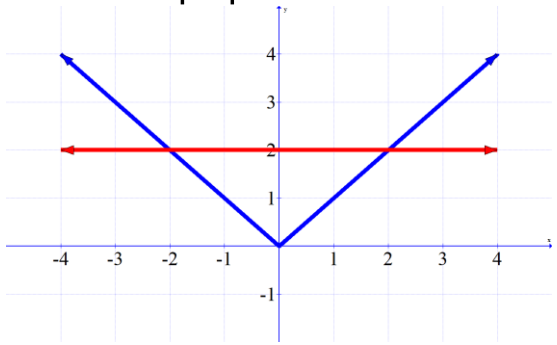
a) The solutions of $|x| = p$ are those numbers that satisfy $x = p$ or $x = -p$.

b) The equation $|x| = 0$ is equivalent to the equation $x = 0$.

c) The equation $|x| = -p$ has no solution.

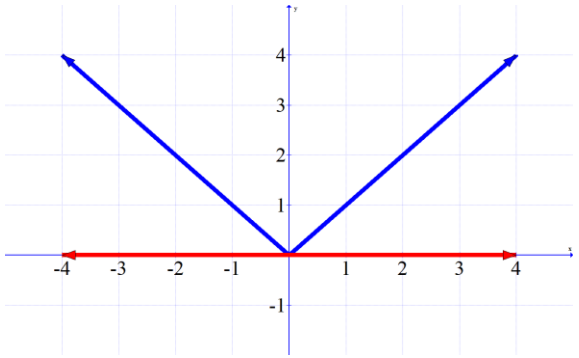
Solve the following absolute value equations graphically.

$|x| = 2$



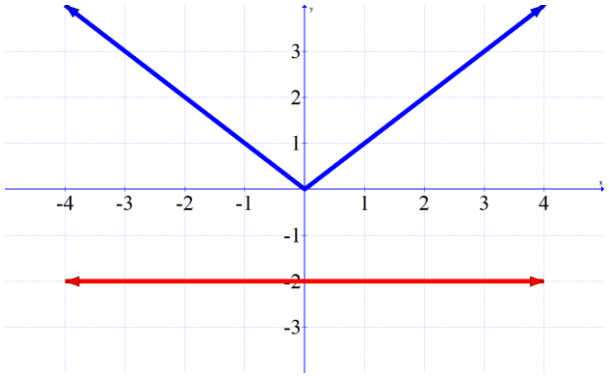
The solution set is _____

$|x| = 0$



The solution set is _____

$|x| = -2$



The solution set is _____

Solve each absolute value equation.

$|x| = 4$

The solution set is_____

$|x - 3| = 8$

The solution set is_____

$|5x + 7| = -1$

The solution set is_____

$|3x + 6| = 0$

The solution set is_____

Solve the absolute value equation.

$3\,|2x - 5| - 7 = -1$

The solution set is_____

Solve the absolute value equation.

$$\left|\frac{4-5x}{6}\right| = 3$$

The solution set is_____

Solving $|ax+b|=|cx+d|$

Let a, b, c, and d be constants. Then

$$|ax+b|=|cx+d|$$

is equivalent to

$$ax+b=cx+d \quad or \quad ax+b=-(cx+d)$$

Solve the absolute value equation.

$$|5x + 7| = |4x + 3|$$

The solution set is_____

Solve the absolute value equation.

$$|x - 9| = |x + 6|$$

The solution set is_____

Solve the absolute value equation.

$$|n - 3| = |3 - n|$$

The solution set is_____