

Think It Through

January 11

1. Sketch the graph of each of the following absolute value equations and write each equation in piecewise form:

(a) $y = |x|$

(b) $y = |2x + 1|$

(c) $y = |2x| + 1$

(d) $y = |x^2 - 1|$

(e) $y = |x^2 + 1|$

(f) $y = |x^2| + 1$

(g) $y = |x^2 - 1| - 1$

(h) $y = |(x + 2)(x + 3)| + 2$

(i) $y = |x| + x + 1$

(j) $y = |x^2 - 4| + x^2 - 5$

For each of the graphs above check your answer using a graphing calculator

2. Solve each of the following equations:

(a) $|x + 4| = 2x + 1$

Solution: 3

(b) $|1 - 4x| = 6x$

Solution: $\frac{1}{10}$

(c) $|x^2 - 26| = 10$

Solution: 4, 6, -4, -6

(d) $|x^2 + 10x + 15| = 6$

Solution: -9, -7, -3, -1

3. ★ Find the solution set of the following equation: $2 = |x - 2| + |x - 4|$.

Solution: $x \in [2, 4]$