

Absolute-Value Practice

(Solving Equations and Inequalities with Absolute Values)

Math 130 *Kovitz*

1. Solve for x .

$$|x + 7| = 10.$$

2. Solve for x .

$$x + 2|x| = 30.$$

3. Solve for x .

$$1 - |x| = -\frac{1}{2}x.$$

4. Solve for x .

(a) $x = \sqrt{x + 6}$

(b) $|x| = \sqrt{x + 6}$

5. Solve for x .

$$\frac{|x|}{|x - 2.25|} = 2$$

6. Solve for x .

(a) $2|x| = |x - 2|$

(b) $\frac{|x|}{|x - 3|} = 2$

7. Solve for x .

$$3x - 2|x| = x^2 - 6$$

8. Solve for x .

$$|x + 3| + |x - 1| = 4.$$

9. Solve for x .

$$|x + 6| + |x - 2| < 9.$$

10. Solve for x .

$$|x| + 11|y| = 36$$

$$|x| - y = 6$$

Give each answer as a pair of numbers: one for x and one for y , stating which is for x and which is for y .

There are more than two answers, each answer being an ordered pair.

Answers follow.

Answers.

1. -17 and 3 .
2. 10 and -30 .
3. 2 and $-2/3$.
4. (a) 3 .
(b) 3 and -2 .
5. 1.5 and 4.5 .
6. (a) $2/3$ and -2 .
(b) 2 and 6 .
7. 3 and -6 .
8. $-3 \leq x \leq 1$.
9. $-6.5 < x < 2.5$.
10. $x = -3$ and $y = -3$; or
 $x = 3$ and $y = -3$; or
 $x = -8.5$ and $y = 2.5$; or
 $x = 8.5$ and $y = 2.5$.

One thing to note is that any ordered pair which is a solution produces another solution where the x has opposite sign.