

Algebra 2
Absolute Value Equations

Name Key!

Rules:

1. Isolate bars
2. Check for special cases
3. Solve by setting up 2 cases
4. Check. Some answers may be extraneous.

1. $|2x+3|=4$

$$2x+3=4$$

$$2x=1$$

$$x = \frac{1}{2}$$

$$2x+3=-4$$

$$2x=-7$$

$$x = -\frac{7}{2}$$

2. $|x-3|=3x+5$

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

$$2x=-8$$

$$x = -4$$

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

$$4x=-2$$

$$x = -\frac{2}{4}$$

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

3. $|4-3x|-9=3$

$$|4-3x|=12$$

$$4-3x=12$$

$$-3x=8$$

$$x = -\frac{8}{3}$$

$$4-3x=-12$$

$$-3x=-16$$

$$x = \frac{16}{3}$$

4. $|10x+2|-18=-12$
 $+18 +18$

$$|10x+2|=6$$

$$10x+2=6$$

$$10x=4$$

$$x = \frac{4}{10}$$

$$x = \frac{2}{5}$$

$$10x+2=-6$$

$$10x=-8$$

$$x = -\frac{8}{10}$$

$$x = -\frac{4}{5}$$

5. $|2x+8|+2=1$
 $-2 -2$

$$|2x+8|=-1$$

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6. $|x+4| = 6x+1$

$$|x+4|=6x+1$$

$$x+4=6x+1$$

$$5x=3$$

$$x = \frac{3}{5}$$

$$x+4=-6x-1$$

$$7x=-5$$

$$x = -\frac{5}{7}$$

7. $\frac{1}{3}|3x+6|-2=2$

$$\frac{1}{3}|3x+6|=4$$

$$|3x+6|=12$$

$$3x+6=12$$

$$3x=6$$

$$x = 2$$

$$3x+6=-12$$

$$3x=-18$$

$$x = -6$$

8. $|4+x|=1-2x$

$$4+x=1-2x$$

$$3x=-3$$

$$x = -1$$

$$4+x=-1+2x$$

$$x = -5$$