Section 1.8 Math 1300 Section 1.8: Solving Absolute Value Equations

Remember

|-5|=5 The **absolute value** of x, denoted |x|, is the distance x is from 0.

Absolute Value Equations

To solve the equation |x| = C, use the following properties:

If C is positive, then |x| = C is equal to $x = \pm C$. If **C** is negative, then |x| = C has no solution.

If **C** is zero, then the solution of |x| = 0 is x = 0.

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If the absolute value equation is more complicated than |x| = C, **isolate** the absolute value first and then solve it.

Examples:

1. Solve for x.

$$|x| = 6 \qquad 6 > 0$$

$$x = \pm 6$$

151=5

|0| = 0

 $|x|=3 x=\pm 3$

 $|x| = -\frac{1}{2}$ no solution

X = 🔿

2. Solve for x.

$$|\frac{2x-3}{2}| = 7 \qquad \boxed{2}$$

$$2x-3 = \pm 7$$

$$2x-3 = 7$$

$$2x-3 = 7$$

$$2x-3 = 7$$

$$2x-3 = 7$$

$$2x = 5$$

$$2x = -4$$

$$2x = -4$$

$$2x = -2$$

$$2x = -4$$

$$2x = -2$$

$$2x = -2$$

$$2x = -2$$

$$3. \text{ Solve for } x.$$

$$\begin{vmatrix} 6 - 2x \end{vmatrix} = 8 \qquad 8 > 0$$

$$6 - 2x = -8$$

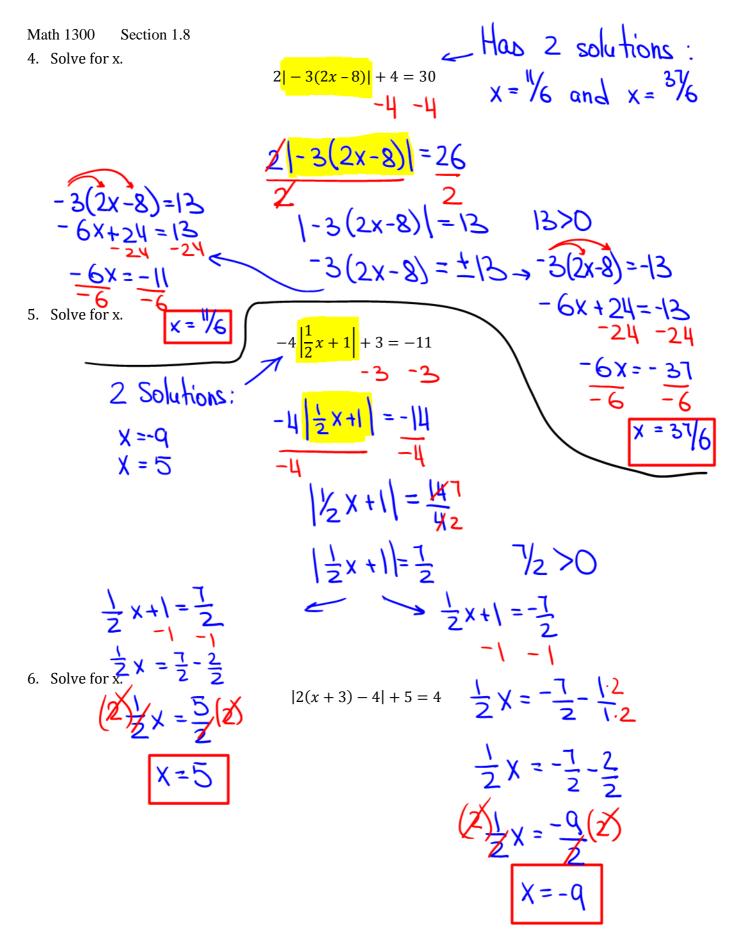
$$-6 \qquad -6 \qquad -6$$

$$-2x = 8 \qquad 6 - 2x = -8$$

$$-6 \qquad -6 \qquad -6 \qquad -6$$

$$-2x = 2 \qquad -6 \qquad -6 \qquad -6$$

$$-2x = -14$$



$$2(x+3)-4 +5 = 4$$

$$-5 -5$$

$$2(x+3)-4 = -1$$
No solution
$$2(x+3)-4 +4 = 4$$

$$-4 -4$$

$$2(x+3)-4 = 0$$

$$+4 +44$$

$$\frac{7}{x} +3 = 0$$

$$+4 +44$$

$$\frac{7}{x} -3 = 4$$

$$\frac{7}{x} = -4$$