

### Solving Absolute Value Equations

Examples:

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

$$|x+3|=2$$

$$x+3=2 \quad x+3=-2$$

$$x=-1 \quad x=-5$$

$$1) |2x-6|+3=9$$

$$2) \frac{1}{3}|x+4|-1=8$$

$$|x|=-6$$

*No Solutions!*

$$3) |x+1|+8=-2$$

$$4) |x+3|-8=-2$$

### Solving Absolute Value Inequalities

Examples:

$$|x+3|>1$$

$$x+3>1 \quad x+3<-1$$

$$x>-2 \quad x<-4$$

$$x>-2 \text{ or } x<-4$$

$$5) 2|x-4|<6$$

$$6) \frac{1}{2}|x|+7>10$$

$$-2|x|+4>-6$$

$$-2|x|>-10$$

$$|x|<5$$

$$x<5 \quad x>-5$$

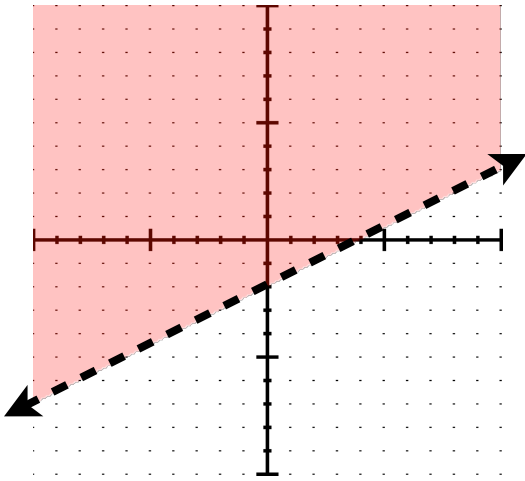
$$-5<x<5$$

$$7) -3|x-1|<-9$$

$$8) -\frac{1}{2}|x+2|>-1$$

## Graphing Inequalities

$$y > \frac{1}{2}x - 2$$

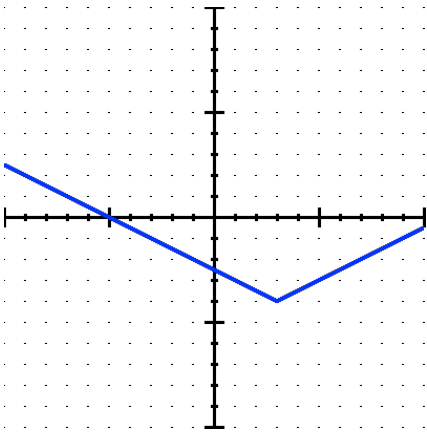


$$9) y \leq 2x + 1$$

$$10) y > -\frac{1}{3}x + 5$$

## Graphing Absolute Value Equations

$$y = \frac{1}{2}|x - 3| - 4$$



$$11) y = -2|x| + 1$$

$$12) y = |x + 2| + 3$$

## No Solutions / Infinitely Many Solutions

$$2(x + 5) > 2x + 5$$

$$2x + 10 > 2x + 5$$

$$10 > 5$$

*Infinitely Many Solutions*

$$x - 4 < x - 6$$

$$0 < -2$$

*No Solutions*

$$13) 3x - 6 \leq 3(x + 2)$$

$$14) x + 5 > x + 20$$

## Solving Inequalities

$$-10 \leq 2(x+1) < 14$$

$$-10 \leq 2x+2 < 14$$

$$-12 \leq 2x < 12$$

$$-6 \leq x < 6$$

$$15) 6 < -2x+4 \leq 8$$

$$16) -2x > x-6 \text{ or } \frac{1}{3}x > 2$$

$$5-x > 2 \text{ or } x-7 \geq 5$$

$$-x > -3 \text{ or } x \geq 12$$

$$x < 3 \text{ or } x \geq 12$$

## Answers

$$1) x = 0,6$$

$$2) x = -31,23$$

3) *No Solutions*

$$4) x = -9,3$$

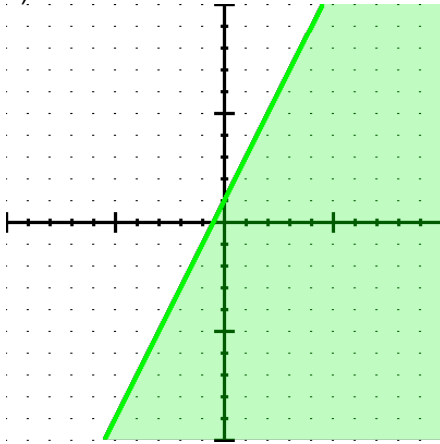
$$5) 1 < x < 7$$

$$6) x < -6 \text{ or } x > 6$$

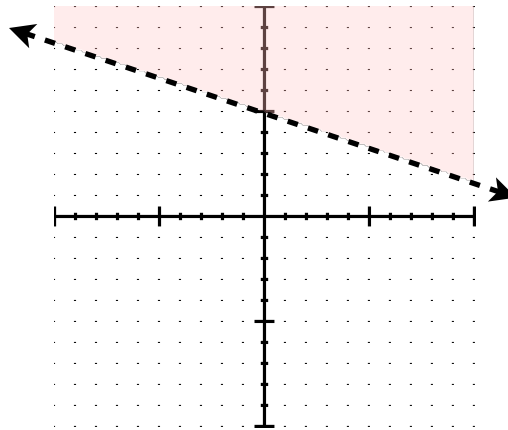
$$7) x < -2 \text{ or } x > 4$$

$$8) -4 < x < 0$$

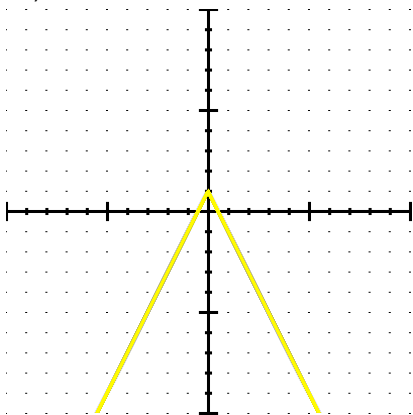
9)



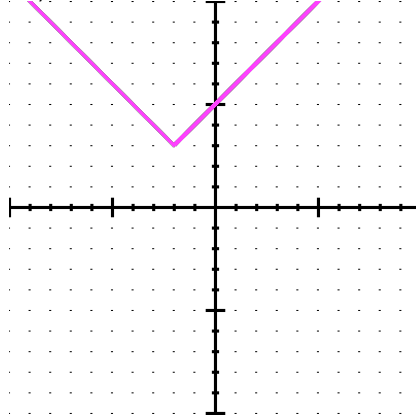
10)



11)



12)



13) Infinitely Many Solutions

14) No Solutions

$$15) -2 \leq x < -1$$

$$16) x < 2 \text{ or } x > 6$$