

Algebra 1            5.5

Solve and graph absolute value inequalities

Write an absolute value inequality from a graph  
inequality

absolute value

less than

greater than

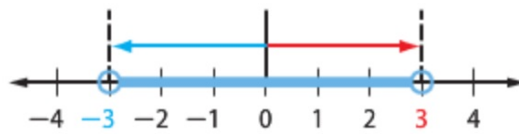
floor graphs

whiteboards

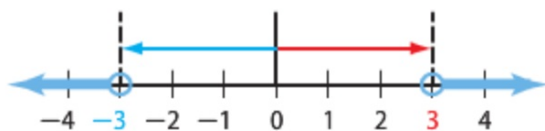
speed dating

Find the bubble  
Less than = Closer  $\leftarrow$   
Greater than = Farther  $\rightarrow$   
open or closed? *inside*  
*outside*

**1 Absolute Value Inequalities ( $<$ )** The inequality  $|x| < 3$  means that the distance between  $x$  and 0 is less than 3.



**2 Absolute Value Inequalities ( $>$ )** The inequality  $|x| > 3$  means that the distance between  $x$  and 0 is greater than 3.



∴

$$|Start| \pm$$

$$|x-30| < 5$$



$$|x-70| < 10$$

whiteboards

Solve  inequality. Then graph the solution set.

1.  $|a - 5| < 3$

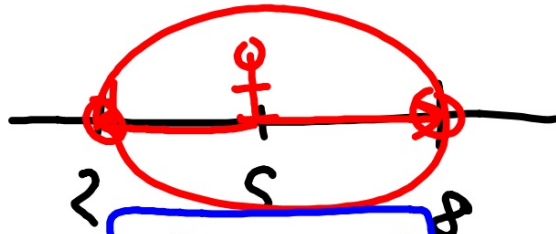
2.  $|u + 3| < 7$

Bubble

Closer or farther?

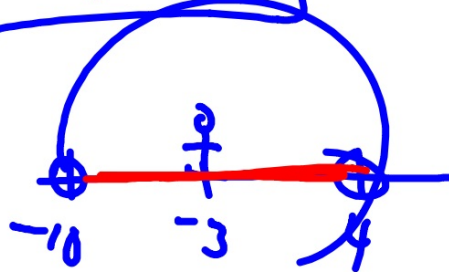
What's in the middle?

$$\begin{array}{r} a - 5 = -3 \\ +5 \quad +5 \\ \hline a = 2 \end{array} \quad \begin{array}{r} a - 5 = 3 \\ +5 \quad +5 \\ \hline a = 8 \end{array}$$



$$2 < a < 8$$

$$\begin{array}{r} u + 3 = -7 \\ -3 \quad -3 \\ \hline u = -10 \end{array} \quad \begin{array}{r} u + 3 = 7 \\ -3 \quad -3 \\ \hline u = 4 \end{array}$$

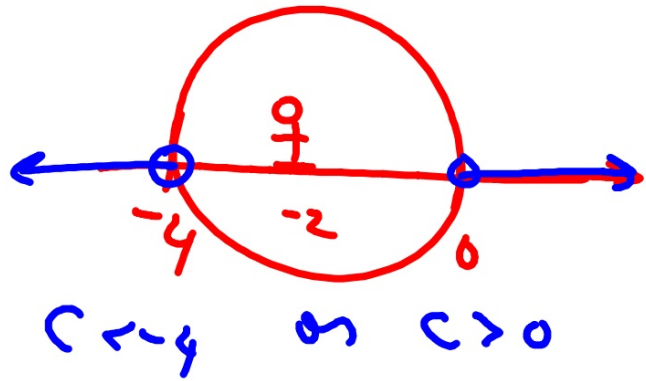


$$-10 < u < 4$$

4.  $|c+2| > -2$

5.  $|n+5| \square 3$

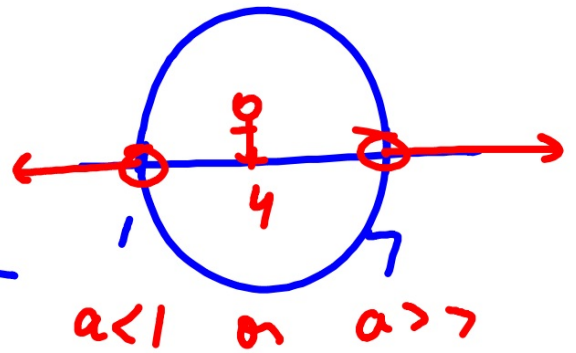
$$\begin{array}{r} c+2 = -2 \\ -2 \quad -2 \\ \hline c = -4 \end{array} \quad \begin{array}{r} c+2 = 2 \\ -2 \quad -2 \\ \hline c = 0 \end{array}$$



$$15. \quad |a + -4| > 3$$

$$\begin{array}{r} a + -4 = -3 \\ +4 \quad +4 \\ \hline a = 1 \end{array}$$

$$\begin{array}{r} a + 4 = 3 \\ +4 \quad +4 \\ \hline a = 7 \end{array}$$

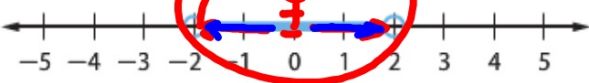




REGULARITY

Write an open sentence involving absolute value for each graph.

32.



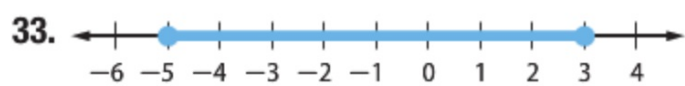
$$|x - 0| < 2$$

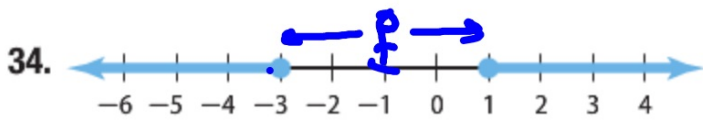
What's in the middle?

Bubble?

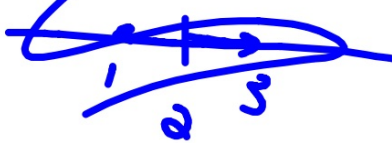
Closer or farther?

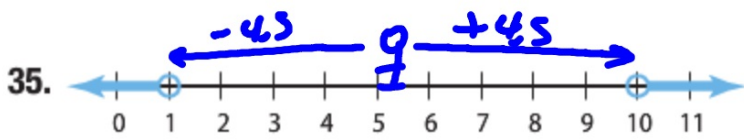




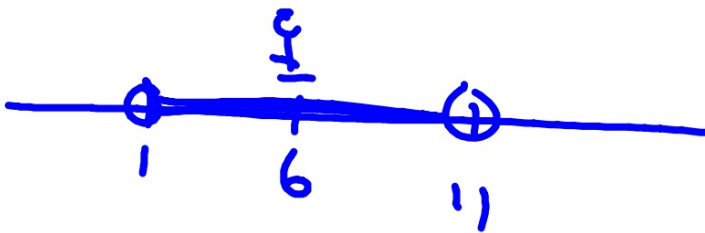


$|x+1| \geq 2$   ~~$|x-2| > 1$~~

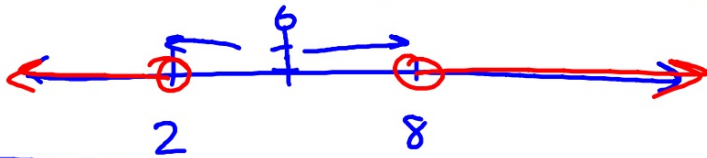
~~ A number line is shown with tick marks at 1, 2, and 3. There are blue diamonds at 1 and 3. A blue bracket above the line connects these two points, with arrows pointing outwards from 1 and 3, indicating the solution set  $x < 1$  or  $x > 3$ .~~



$$|X - 5.5| > 4.5 \quad |X - 5| < 6$$

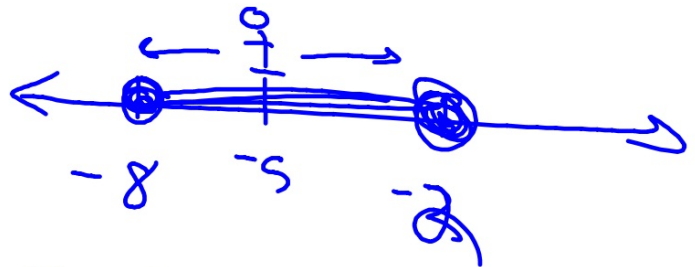


$|x - \text{middle}|$  bubble



$$|x - s| > 3$$

$$x - s$$
$$s - x$$
$$x + s$$



$$x - s$$
$$|x + s| \leq 3$$

