

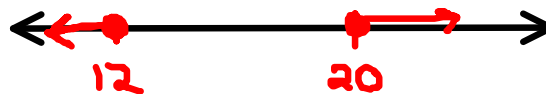
Absolute Value Inequalities

Directions: Solve each inequality and graph your solution on a number line.

1. $|x-16| \geq 4$

$$\begin{array}{l} x-16 \geq 4 \\ +16 \quad +16 \end{array} \quad \begin{array}{l} x-16 \leq -4 \\ +16 \quad +16 \end{array}$$

$$x \geq 20 \quad x \leq 12$$



$$\boxed{x \leq 12 \text{ OR } x \geq 20}$$
$$\boxed{x \leq 12 \cup x \geq 20}$$

2. $2|v-2| \leq 12$

$$\frac{2|v-2|}{2} \leq \frac{12}{2}$$

$$|v-2| \leq 6$$

$$\begin{array}{l} v-2 \leq 6 \\ +2 \quad +2 \end{array} \quad \begin{array}{l} v-2 \geq -6 \\ +2 \quad +2 \end{array}$$

$$v \leq 8 \quad v \geq -4$$



$$\boxed{-4 \leq x \leq 8}$$

3. $\frac{|x|}{-2} > -12$

$$\cancel{-2} \cdot \frac{|x|}{\cancel{-2}} > -12 \cdot \cancel{-2}$$

$$|x| < 24$$

$$x < 24 \quad x > -24$$



$$\boxed{-24 < x < 24}$$

$$4. |x-5| < -6$$

NO SOLUTION



$$5. 3|5-x| + 7 < 22$$

$$\frac{3|5-x|}{3} < \frac{15}{3}$$

$$|5-x| < 5$$

$$\begin{array}{r} 5-x < 5 \\ -5 \quad -5 \end{array}$$

$$\frac{-x < 0}{-1 \quad -1}$$

$$x > 0$$

$$\begin{array}{r} 5-x > -5 \\ -5 \quad -5 \end{array}$$

$$\frac{-x > -10}{-1 \quad -1}$$

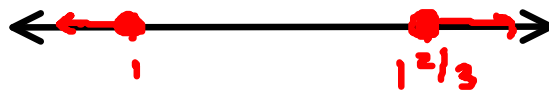
$$x < 10$$



0 < x < 10

$$6. \frac{2}{3} \left| \frac{1}{2}x - \frac{2}{3} \right| \geq \frac{1}{3} \div 2$$

$$\frac{1}{3} \div \frac{2}{3}$$



$$\left| \frac{1}{2}x - \frac{2}{3} \right| \geq \frac{1}{6}$$

$$\frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$$

$$\frac{3}{3} \cdot \frac{1}{2} \times \frac{2}{2} \cdot \frac{2}{3} \geq \frac{1}{6}$$

$$\frac{3}{3} \cdot \frac{1}{2} \times \frac{2}{2} \cdot \frac{2}{3} \leq -\frac{1}{6}$$

$$LCD = 6$$

$$LCD = 6$$

$$x \leq 1 \text{ OR } x \geq \frac{2}{3}$$

$$x \leq 1 \cup x \geq \frac{2}{3}$$

$$\frac{3x}{6} - \frac{4}{6} \geq \frac{1}{6}$$

$$\frac{3x}{6} - \frac{4}{6} \leq -\frac{1}{6}$$

$$3x - 4 \geq 1$$

$$+4 \quad +4$$

$$3x - 4 \leq -1$$

$$+4 \quad +4$$

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

$$\frac{3x}{3} \leq \frac{3}{3}$$

$$x \geq \frac{5}{3} \text{ OR } \frac{2}{3}$$

$$x \leq 1$$

$$7. |5g - 4| - 6 \leq -4$$

$$+6 \quad +6$$



$$|5g - 4| \leq 2$$

$$5g - 4 \leq 2$$

$$+4 \quad +4$$

$$5g - 4 \geq -2$$

$$+4 \quad +4$$

$$\frac{5g}{5} \leq \frac{6}{5}$$

$$\frac{5g}{5} \geq \frac{2}{5}$$

$$g \leq \frac{6}{5} \text{ OR } \frac{1}{5}$$

$$g \geq \frac{2}{5}$$

$$\frac{2}{5} \leq g \leq \frac{1}{5}$$