4-1 Inequalities and their Graphs

Inequalities - Mathematical sentences containing

$$<, >, \leq, \geq$$

less than

Greater than

Less than or = to

Greater than or = to
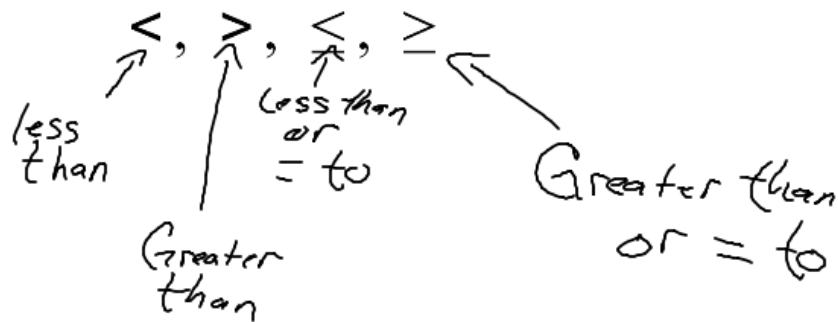
Determine whether the following numbers are solutions:

x > 7

a.) 4	b.) 7	c.) 10	d.) -3
$4 > 7$	$7 > 7$	$10 > 7$	$-3 > 7$
No	No	Yes	No

x ≤ -1

a.) -7	b.) 6	c.) -1	d.) 1
$-7 \leq -1$	$6 \leq -1$	$-1 \leq -1$	$1 \leq -1$
Yes	No.	Yes	No

When you graph inequalities, shade in the direction of the arrow.

<   >   ≤   ≥

Open circle

Closed Circle

Graph

x > 5

-1 ≥ x

$* x \leq -1 *$

Solve and Graph

$$\frac{6x}{6} > \frac{24}{6}$$

$$x > 4$$

$$\frac{7y}{7} \leq \frac{21}{7}$$
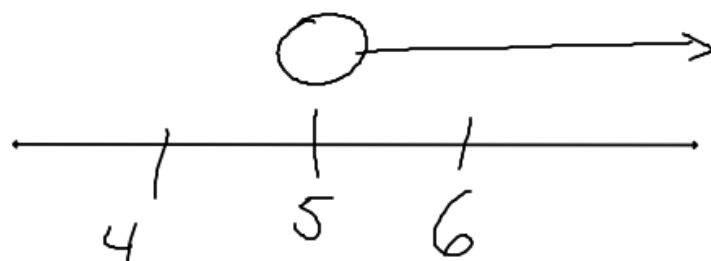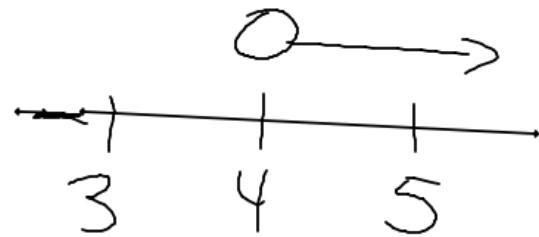
$$y \leq 3$$
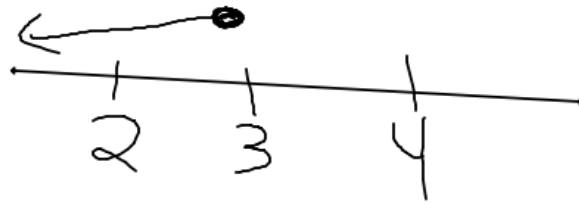
When you multiply or divide over the inequality sign by a negative, FLIP THE INEQUALITY!

$$\frac{-5x}{-5} > \frac{35}{-5}$$

$$x < -7$$

$$-9 \leq -z$$

$$\frac{-z}{-1} \geq \frac{-9}{-1} \qquad z \leq 9$$

Solve

$$5x + 2 < 22$$
$$\ -2 \quad -2$$
$$\frac{5x}{5} < \frac{20}{5}$$
$$x < 4$$

$$5z + 3 \geq 3z + 13$$
$$\ -3 \qquad -3$$
$$5z \geq 3z + 10$$
$$-3z \quad -3z$$
$$2z \geq 10$$

$$\frac{2z}{2} \geq \frac{10}{2}$$
$$z \geq 5$$

$$-7w > 2w + 13$$
$$-2w \quad -2w$$
$$\frac{-9w}{-9} > \frac{13}{-9}$$
$$w < \frac{13}{-9}$$