Sec 6.4

Linear Inequalities in one Variable

English	Symbols
x is atleast 5	$x \geq 5$
x is at most 5	$x \leq 5$
x is between 3 and 5	$3 \leq x \leq 5$
x is less than 5	$x < 5$
x is nomore than 5	$x \leq 5$

Rental company charges \$100 per week and \$0.25 per mile to rent a car. If you can spend no more \$330 on a car rental, how many miles can you drive?

Let x be the number of miles.

$$100 + 0.25x \leq 330$$

$$0.25x \leq 230$$

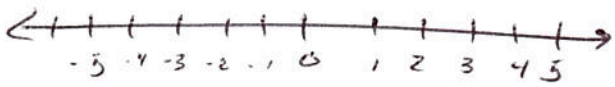
$$x \leq \frac{230}{0.25}$$

$$x \leq 920$$

Drive no more than 920 miles.

Solve just like equations, but if you multiply or divide both sides by a negative number, the inequality reverses.

$-3 \leq 5$

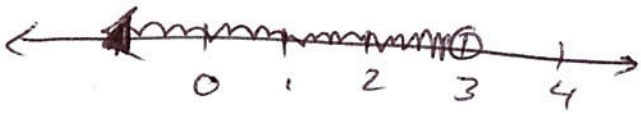


$-1(-3) \qquad -1(5)$

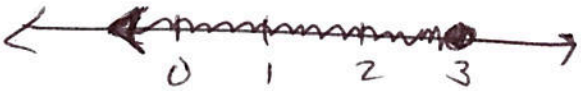
$3 \geq -5$

Graph subsets of real numbers

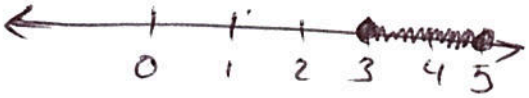
$\{x : x < 3\}$



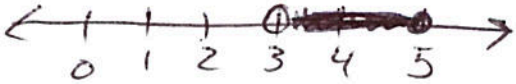
$\{x : x \leq 3\}$



$\{x : 3 \leq x \leq 5\}$



$\{x : 3 < x \leq 5\}$



$\{x : x \geq 3\}$

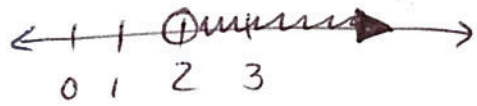
Example:
Solve the inequality, ~~and~~
Express the solution in set builder notation and graph it.

$3x + 5 > 11$

$3x > 6$

$x > 2$

$\{x : x > 2\}$



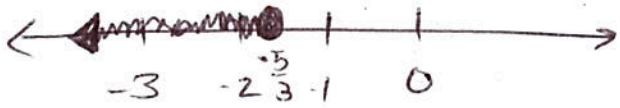
Example: Solve, Express solution in set builder notation, and graph.

$-3x + 4 \geq 9$

$-3x \geq 5$

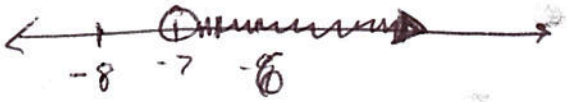
$x \leq -\frac{5}{3}$

$\{x : x \leq -\frac{5}{3}\}$



$$6x - 12 < 8x + 2$$
$$-6x - 2 \qquad -6x - 2$$
$$-14 < 2x$$
$$-7 < x$$

$\{x : x > -7\}$



Three part : Upper + Lower Bounds

face same way

$$-7 < 2x + 5 \leq 3$$

subtract 5

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

Divide by 2

$$-6 < x \leq -1$$

$\{x : -6 < x \leq -1\}$