- Absolute Value Inequalities

$$-10 < |2x+6| < 10 \quad \text{less thand}$$

$$-10 < 2x+6 < 10$$
$$\phantom{-10 <} -6 \quad\quad -6 \quad\quad \cdot 6$$
$$\frac{-16}{2} < \frac{2x}{2} < \frac{4}{2}$$

$$-8 < x < 2$$

$$(-8, 2)$$
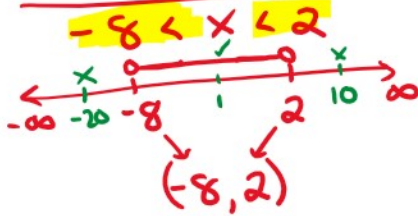
$$-5 \geq |x-4| \geq 5 \quad \text{greater than}$$

$$-5 \geq x-4 \geq 5$$
$$+4 \quad\quad +4 \quad +4$$
$$-1 \geq x \geq 9 \rightarrow -1 \geq x \text{ OR } x \geq 9$$

$$(-\infty, -1] \quad\quad [9, \infty)$$
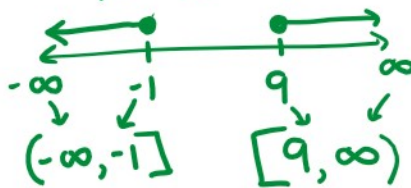
$$|x-4| \geq 5$$

$$x-4 \leq -5 \text{ OR } x-4 \geq 5$$
$$x \leq -1 \quad\quad\quad x \geq 9$$

Special:

| Abs. Val. | > = # | | Abs. Val. | < - # |

$$|3x-5| \geq -2$$
$$\mathbb{R}$$
IMS

$$|5x+3| < -10$$
$$\varnothing$$
No Solutions

- Graphing Inequalities

$$y \, \textcircled{<} \, -\frac{1}{2}x + 3$$
$$\phantom{y <} \uparrow \quad\quad \uparrow$$
$$\phantom{y <} \text{slope} \quad \text{y-int}$$

① Solve for y
(y=mx+b form)

② Sketch the graph
(plot y-int, use slope to plot more points)

$$\frac{-1}{2} \quad \frac{\text{rise}}{\text{run}}$$

③ Dotted line (not equal to) > or <
vs.
Solid line (equal to) ≥ or ≤

④ shade above (greater than) ≥ or >
or
shade below (less than) ≤ or <
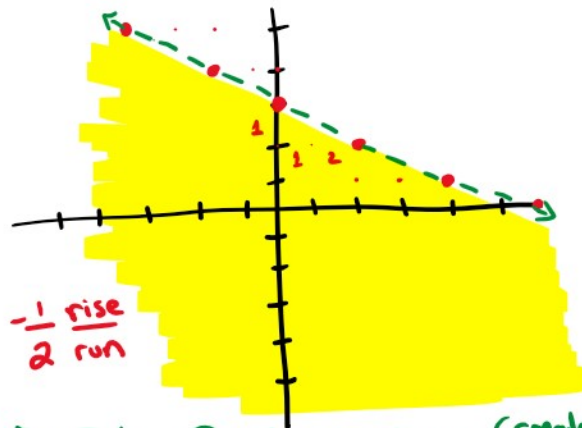
- Solving Systems of Inequalities
(only method is graphing)

$$y \geq 2x-3$$

② single shading

④ double shading

① no shading

$$y < -3x+4$$

double
shading

no
shading

③ single
shading