Solve and graph on a number line.

Write answer in set notation and interval notation.

$$-\frac{1}{5}(x-5) > x-9$$

$-\frac{1}{5}x + 1 > x - 9$

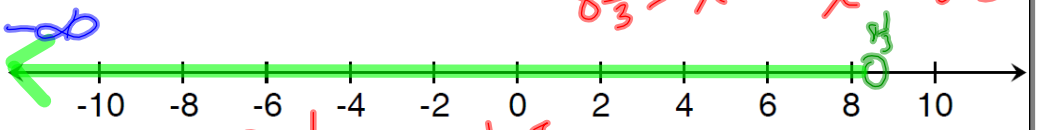
$+9 \quad +9$

$-\frac{1}{5}x + 10 > x$

$+\frac{1}{5}x \quad +\frac{1}{5}x$

$10 > \frac{6}{5}x$ $\times \frac{5}{6}$

$8\frac{1}{3} > x$ $\quad x < 8\frac{1}{3}$



Set $\{x \mid x < 8\frac{1}{3}\}$

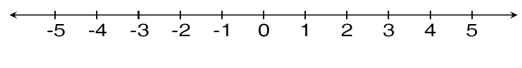
Interval $(-\infty, 8\frac{1}{3})$

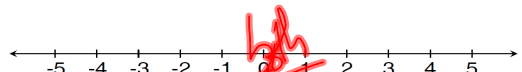
A compound inequality is 2 or more inequalities joined by "and" or "or".

Both

intersection "and" $\cap$

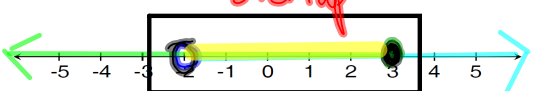
$x > -2$ and $x \leq 3$





both

overlap



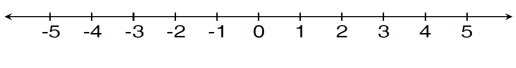
$(-2, 3]$

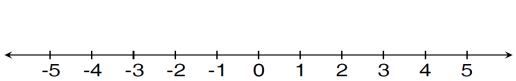
$\{x \mid -2 < x \leq 3\}$

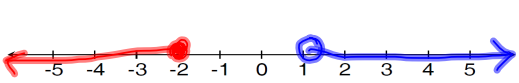
either

union "or" $\cup$

$x > 1$ or $x \leq -2$







Interval $(-\infty, -2] \cup (1, \infty)$

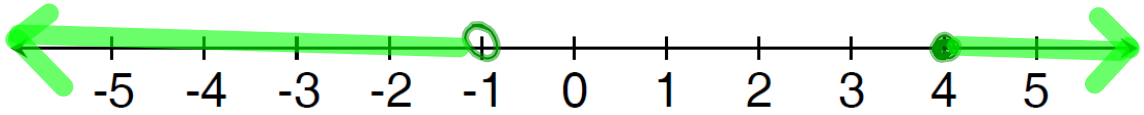
Set $\{x \mid x \leq -2 \cup x > 1\}$

Translate and graph.

All real numbers that are less than -1 or greater than or equal to 4.

$x < -1$ $\cup$ $x \geq 4$

$(-\infty, -1) \cup [4, \infty)$



$\{x \mid x < -1 \cup x \geq 4\}$

Solve compound inequalities (intersections)

$$10 \leq 2y + 4 \leq 24$$

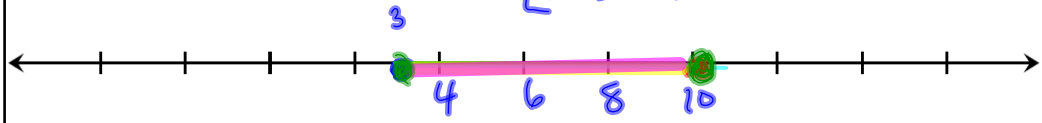
$10 \leq 2y + 4$ and $2y + 4 \leq 24$

$-4 \quad -4 \qquad -4 \quad -4$

$\frac{6}{2} \leq \frac{2y}{2}$ $\qquad \frac{2y}{2} \leq \frac{20}{2}$

$3 \leq y$ $\quad y \geq 3$ and $y \leq 10$

$[3, 10]$



$\{y \mid 3 \leq y \leq 10\}$

Solve compound inequalities (intersections)

$$-7 < -z - 1 < 3$$

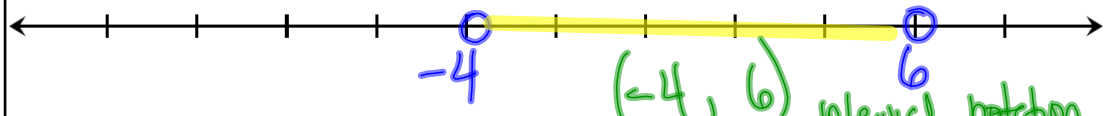
$+1 \quad +1 \quad +1$

$-6 < -z < 4$

$\frac{-6}{-1} < \frac{-z}{-1} < \frac{4}{-1}$

$6 > z > -4$

$\{z \mid -4 < z < 6\}$



$(-4, 6)$ interval notation

not an ordered pair

Solve compound inequalities (unions)

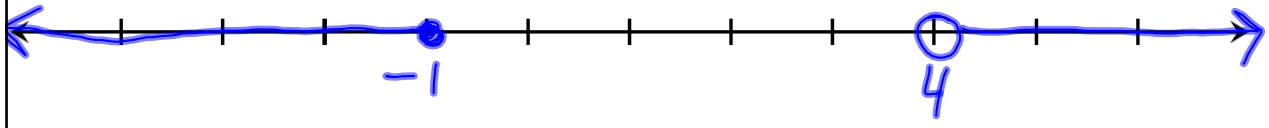
$$4c + 1 \leq -3 \text{ or } 5c - 3 > 17$$

$-1 \quad -1$ $\qquad +3 \quad +3$

$\frac{4c}{4} \leq \frac{-4}{4}$ $\qquad \frac{5c}{5} > \frac{20}{5}$

$\{c \mid c \leq -1 \text{ U } c > 4\}$

$(-\infty, -1] \cup (4, \infty)$



$-3 \geq x - 1$ and $x - 5 > 2$

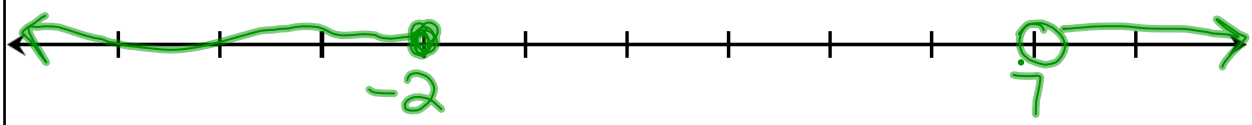
$+1 \quad +1$ $\qquad$ $+5 \quad +5$

$-2 \geq x$ And $x > 7$

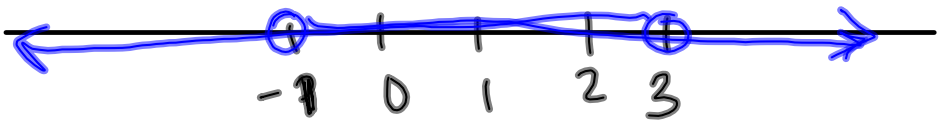
are in both?

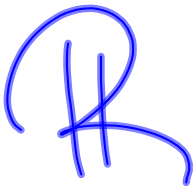
Empty set $\emptyset$

No Real Solution



$x > -1$ OR $x < 3$





Five more than x is less than 8 and
3 less than x is greater than 5.

x < 5 or x > 2

x > 5 or x > 2

x > 5 and x > 2

Homework:
Pg 384 - 385 #2 - 26 evens, 33 - 36 all