Day 6

1.4 Solving Inequalities ($\mathbb{R}$ #'s)

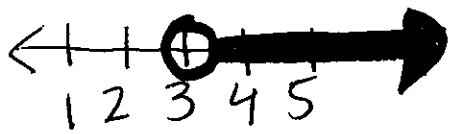
these rules only apply if the variable is on the left

$<$, $\leq$ shade left (less thans)

$>$, $\geq$ shade right (greater thans)

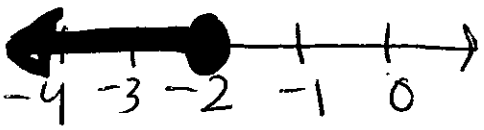
(ex) $<$, $>$ open circle

$x > 3$



(ex) $\leq$, $\geq$ closed circle

$y \leq -2$



An inequality can have many solutions, all real #'s, or NO solution.

★ If you divide or multiply by a negative #, the inequality sign flips! ★

$-1(5) > (-2)-1$

$-5 > 2$ False

$-5 < 2$ True

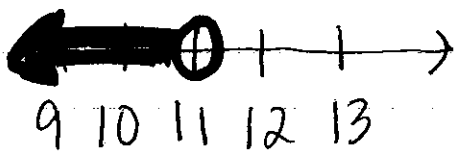
Solve + Graph

① $3x - 6 < 27$

$+6 \quad +6$

$\frac{3x}{3} < \frac{33}{3}$

$x < 11$



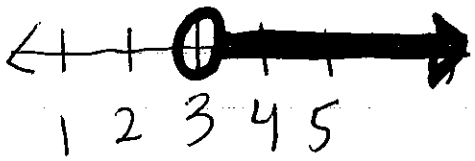
ex $-2x < 3(x-5)$

$-2x < 3x - 15$

$-3x \quad -3x$

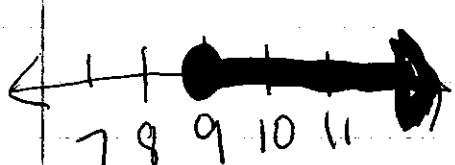
$\frac{-5x}{-5} < \frac{-15}{-5}$

$x > 3$



ex $9 \leq x$ → this means $x \geq 9$

greater than or = to



ex $12 \geq 2(3n+1) + 22$

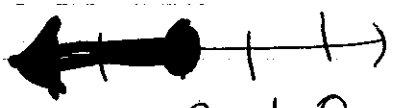
$12 \geq 6n + 2 + 22$

$12 \geq 6n + 24$

$-24 \quad -24$

$\frac{-12}{6} \geq \frac{6n}{6}$

$-2 \geq n$ ($n \leq -2$)



ex $2x < 2(x+1)+3$

$2x < 2x+2+3$

$2x < 2x+5$

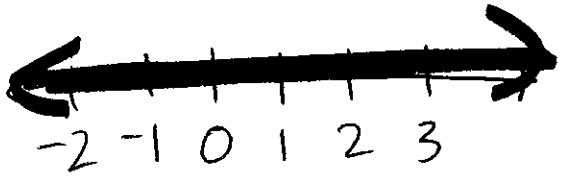
$-2x \quad -2x$

$0 < 5$ true

* if variables cancel + you get a true statement, then x can be any real #

All ℝ #'s

↑ answer



↖ answer

ex $4(x-3)+7 \geq 4x+1$

$4x-12+7 \geq 4x+1$

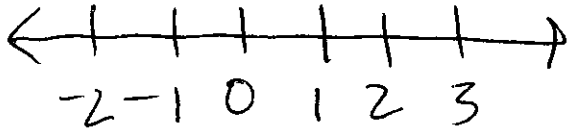
$4x-5 \geq 4x+1$

$-4x \quad -4x$

$-5 \geq 1$ False statement

= No Solution

$\emptyset$ OR



NO shading on the # line

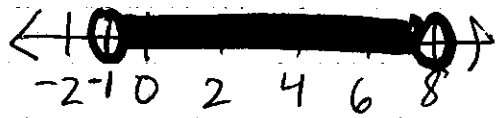
Compound Inequality

(ex) $-6 < 2x - 4 < 12$

$+4 \quad +4 \quad +4$

$\frac{-2}{2} < \frac{2x}{2} < \frac{16}{2}$

$-1 < x < 8$



(x is between -1 and 8)

(ex) $3x + 9 < -3$ OR $-2x + 1 < 5$

$-9 \quad -9 \quad -1 \quad -1$

$\frac{3x}{3} < \frac{-12}{3} \qquad \frac{-2x}{-2} < \frac{4}{-2}$

$x < -4$ OR $x > -2$