E) Solving One-Step Inequalities

Solution Set = All of the values of the variable that make the inequality true.

Inequality Symbols

$1 > -2$ Read as "1 is **greater than** 2"

$3 < 5$ Read as "3 is **less than** 5"

$X \geq 3$ Read as "X is **greater than or equal to** 3"

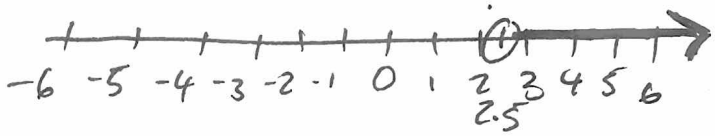
$X \leq 4$ Read as "X is **less than or equal to** 4"

Solve the inequality. Graph your solution.

1) $x - 6 > -3.5$

$+6 \quad +6$

$X > 2.5$

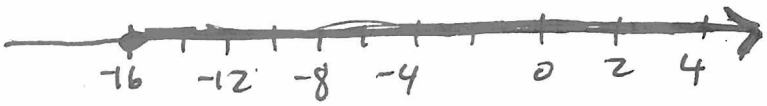


2) $-8 \leq 8 + y$

$-8 \quad -8$

$-16 \leq y$

$y \geq 16$

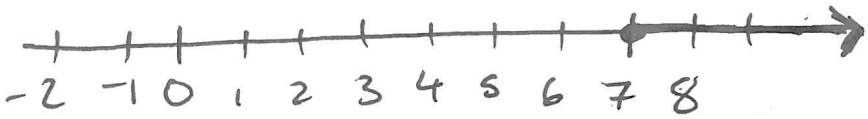


3) $-1\frac{1}{3} \leq p - 8\frac{1}{3}$

$+8\frac{1}{3} \quad +8\frac{1}{3}$

$7 \leq p$

$p \geq 7$



4) $\frac{x}{4} < 5$

$(4)\frac{x}{4} < 5(4)$

$x < 20$

5) $-6x < 18$

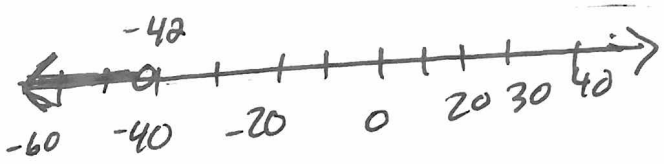
$\frac{-6x}{-6} \quad \frac{18}{-6}$

$x > -3$

6) $\frac{x}{-6} > 7$

$(-6)\left(\frac{x}{-6}\right) > 7(-6)$

$x < -42$



F) Solving Multi-Step Inequalities

Solve the inequality. Then Graph.

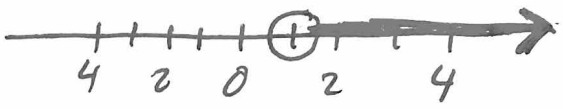
1) $-7x + 2 < -5$

$-2 \quad -2$

$-7x < -7$

$\frac{-7x}{-7} < \frac{-7}{-7}$

$x < 1$



2) $\frac{1}{3}(3x + 6) \geq -1$

$(3)\frac{1}{3}(3x+6) \geq -1(3)$

$3x + 6 \geq -3$

$-6 \quad -6$

$\frac{3x}{3} \geq \frac{-9}{3}$ $\quad x \geq -3$

3) $14x + 5 < 7(2x - 3)$

$14x + 5 < 14x - 21$

$-14x \quad -14x$

$5 < -21$

False No solution

4) $12x - 1 > 6(2x - 1)$

$12x - 1 > 12x - 6$

$-12x \quad -12x$

$-1 > -6$

True

All real numbers!

Final Notes:

- Dividing or Multiplying by a negative flips the inequality sign
- $\leq$ and $\geq$ are closed circles on the number line
- $<$ and $>$ are open circles on the number line
- Untrue or false inequalities are no solution
- True variables inequalities are all real numbers

Without