KEY

AA – Section 3.2 – Solving Inequalities Using Addition and Subtraction

Objective: To use addition and subtraction to solve inequalities.

Essential Understanding: Just as we used the Properties of Equality to solve equations; you can use Properties of Inequalities to solve inequalities.

Addition Property of Inequality:	If $a > b$, then $a + c > b + c$.
	If $a < b$, then $a + c < b + c$.
Subtraction Property of Inequality:	If $a > b$, then $a - c > b - c$.
	If $a < b$, then $a - c < b - c$.

Vocabulary: Equivalent inequalities are inequalities that have the same solution.

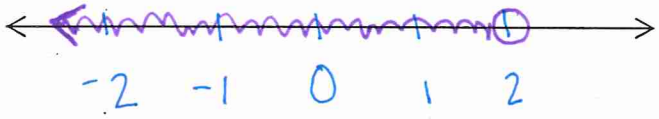
Examples using the Addition & Subtraction Properties of Inequalities –

Solve the inequalities and graph the solution.

1. $x - 5 < -3$

$+5 \quad +5$

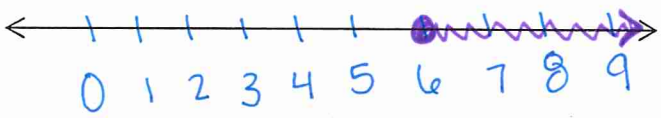
$x < 2$



2. $x + 3 \geq 9$

$-3 \quad -3$

$x \geq 6$

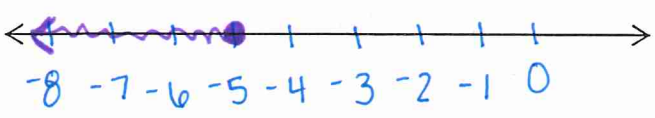


3. $-1 \geq y + 4$

$-4 \quad -4$

$-5 \geq y$

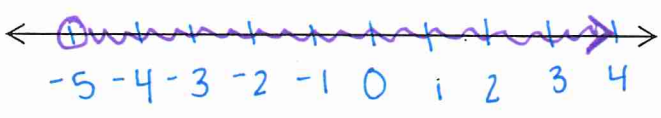
$y \leq -5$



4. $x - 2 > -7$

$+2 \quad +2$

$x > -5$



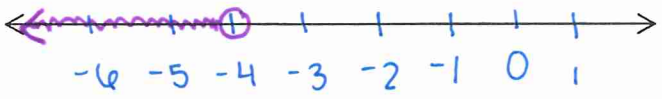
You try:

5. $-6 > x - 2$

$+2 \quad +2$

$-4 > x$

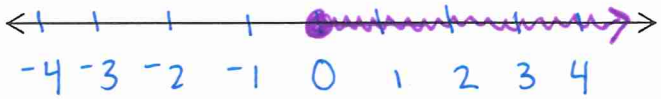
$x < -4$



6. $x - 4 \geq -4$

$+4 \quad +4$

$x \geq 0$

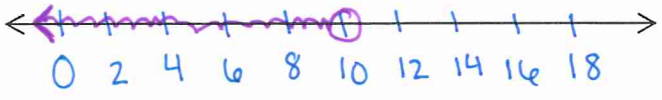


7. $8 > x - 2$

$+2 \quad +2$

$10 > x$

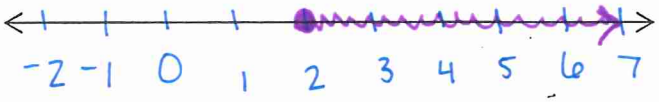
$x < 10$



8. $x - 6 \geq -4$

$+6 \quad +6$

$x \geq 2$



Write and solve an inequality.

9. Suppose it takes no more than 25 minutes to get to school. If you have traveled for 13.5 minutes already, how much longer, at most, might you take to get to school?

X: minutes

$x + 13.5 \leq 25$

$-13.5 \quad -13.5$

$x \leq 11.5$

At most you might have 11.5 minutes to travel to school.

10. It will take at least 360 points for Landon's team to win the math contest. The scores for Landon's teammates were 94, 82, and 87, but one of Landon's teammates lost 2 of those points for an incomplete answer. How many points must Landon earn for his team to win the contest?

X: points

$x + 94 + 82 + 87 - 2 \geq 360$

$x + 261 \geq 360$

$-261 \quad -261$

$x \geq 99$

Landon must earn at least 99 points to win the contest.