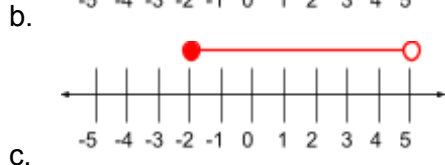
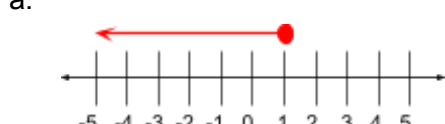


MHF4U: Linear Inequalities

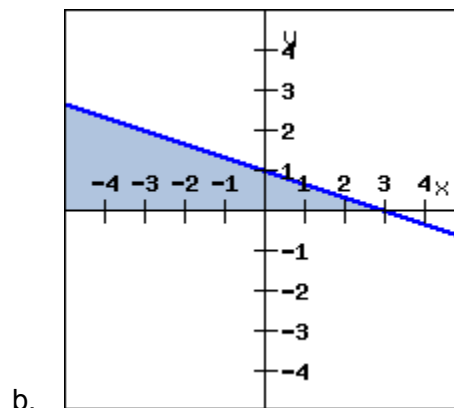
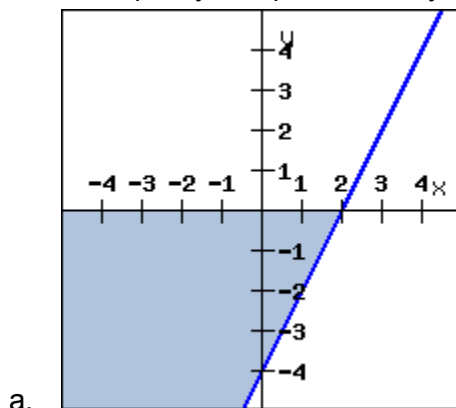
1. For each number line below, state the inequality using both set and interval notations.



2. Represent each inequality using a number line.

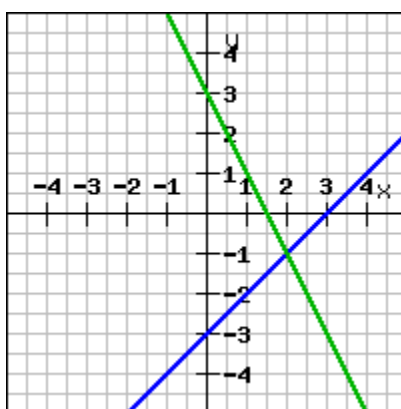
- $x < 3$
- $[2, \infty)$
- $\{x < 0\} \cup \{x > 4\}$
- $[-3, 2)$

3. What inequality is represented by each graph?

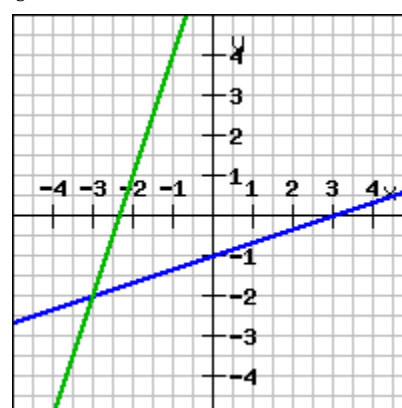


4. Use each graph to solve the given inequality.

a. $x - 3 > -2x + 3$



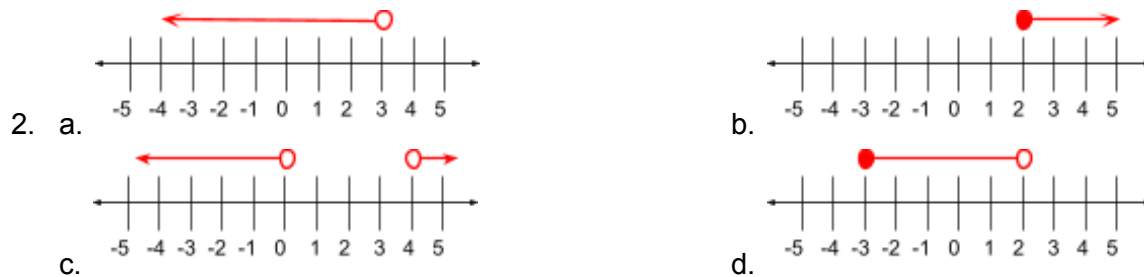
b. $\frac{1}{3}x - 1 \leq 3x + 7$



5. Graph each linear relation, or system of linear equations, to solve each inequality.
 - a. $-2x + 3 > 0$
 - b. $3x - 5 > x + 1$
6. Solve each inequality algebraically.
 - a. $4x + 3 > 0$
 - b. $-5x + 2 \leq 0$
 - c. $3x - 5 \geq 7x + 3$
 - d. $6x - 5 \leq 2x + 1$
7. Explain why the inequalities $3x - 5 < 0$ and $2x + 1 > 5x - 4$ are equivalent:
 - a. using an algebraic perspective
 - b. using a graphical perspective
8. Solve the inequality $-2(x - 3) < 5(x + 1) - 12$.
9. If $-2 < x < 5$, determine the values of p and q such that $p < 3x - 1 < q$.

Solutions

1. a. $\{x > -4\}; (-4, \infty)$ b. $\{x \leq 1\}; (-\infty, 1]$ c. $\{x \geq -2\} \cap \{x < 5\}; [-2, 5)$



3. a. $2x - 4 < 0$ b. $-\frac{1}{3}x > 0$ (note: can also use \geq or \leq here)
4. a. $\{x > 2\}$ b. $\{x \geq -3\}$
5. a. $\{x < \frac{3}{2}\}$ b. $\{x > 3\}$
6. a. $\{x > -\frac{3}{4}\}$ b. $\{x \geq \frac{2}{5}\}$ c. $\{x \leq -2\}$ d. $\{x \leq \frac{3}{2}\}$
7. answers may vary
8. $\{x > \frac{13}{7}\}$
9. $p = -7$ and $q = 14$