Name _____ Date _____ Class _____

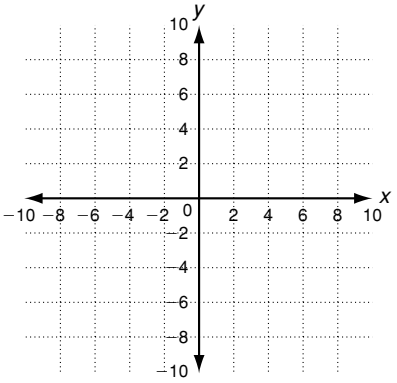
LESSON 3-3

Practice A

Solving Systems of Linear Inequalities

Graph each system of inequalities.

1. $\begin{cases} y \leq 4 \\ y > x - 2 \end{cases}$



a. In order to graph $y \leq 4$, draw the line for $y = 4$.

b. Now shade the area below the line to show $y \leq 4$.

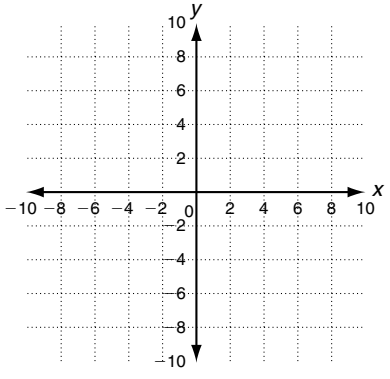
c. In order to graph $y > x - 2$, draw the line that represents $y = x - 2$. Make the line dashed since the line is not included in the inequality.

d. Shade the area above the line.

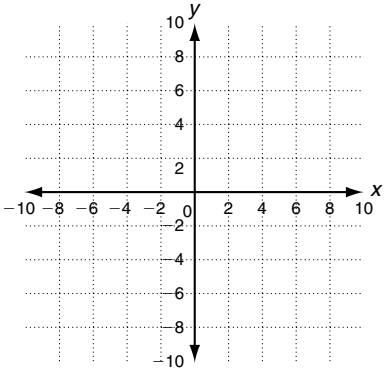
e. Describe the solution region of this system of inequalities.

_____

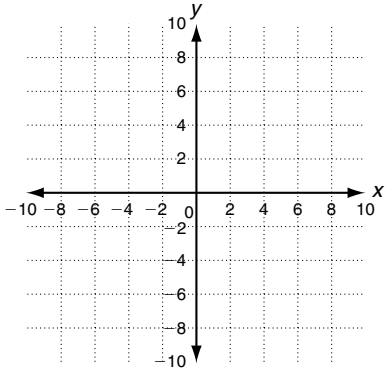
2. $\begin{cases} y > x \\ y > -x \end{cases}$



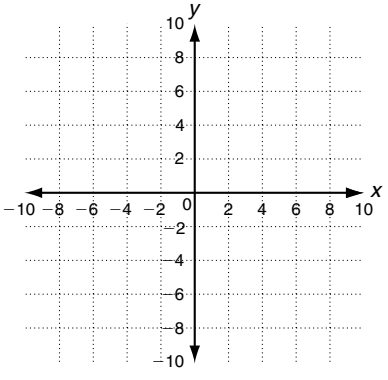
3. $\begin{cases} x \leq -4 \\ y \geq 2 \end{cases}$



4. $\begin{cases} y < 2x + 1 \\ y \geq x \end{cases}$



5. $\begin{cases} y < x - 4 \\ y > -3x + 2 \end{cases}$



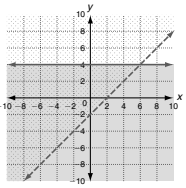
LESSON 3-3

Practice A

Solving Systems of Linear Inequalities

Graph each system of inequalities.

1. $\begin{cases} y \le 4 \\ y > x - 2 \end{cases}$



a. In order to graph $y \le 4$, draw the line for $y = 4$.

b. Now shade the area below the line to show $y \le 4$.

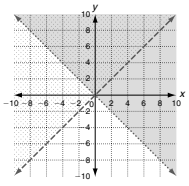
c. In order to graph $y > x - 2$, draw the line that represents $y = x - 2$. Make the line dashed since the line is not included in the inequality.

d. Shade the area above the line.

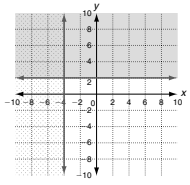
e. Describe the solution region of this system of inequalities.

Possible answer: The solution region is the area where the two shading patterns overlap.

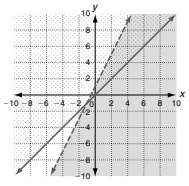
2. $\begin{cases} y > x \\ y > -x \end{cases}$



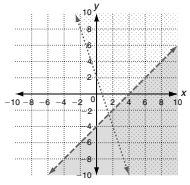
3. $\begin{cases} x \le -4 \\ y \ge 2 \end{cases}$



4. $\begin{cases} y < 2x + 1 \\ y \ge x \end{cases}$



5. $\begin{cases} y < x - 4 \\ y > -3x + 2 \end{cases}$



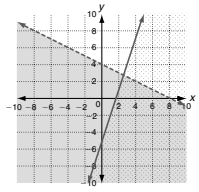
LESSON 3-3

Practice B

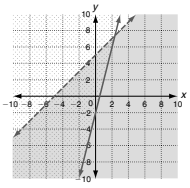
Solving Systems of Linear Inequalities

Graph each system of inequalities.

1. $\begin{cases} y \le 3x - 5 \\ y < -\frac{1}{2}x + 4 \end{cases}$

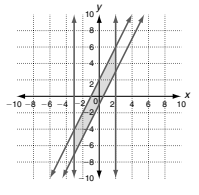


2. $\begin{cases} y < x + 5 \\ y \ge 4x - 2 \end{cases}$

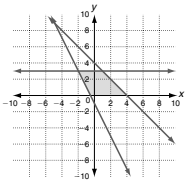


Graph the system of inequalities, and classify the figure created by the solution region.

3. $\begin{cases} x \le 2 \\ x \ge -3 \\ y \le 2x + 2 \\ y \ge 2x - 1 \end{cases}$ Parallelogram



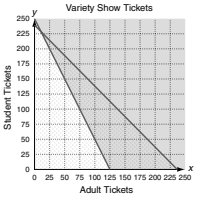
4. $\begin{cases} y \le -x + 4 \\ y \le 3 \\ y \ge 0 \\ y \ge -2x - 1 \end{cases}$ Trapezoid



Solve.

5. The Thespian Club is selling tickets to its annual variety show. Prices are $8 for an adult ticket and $4 for a student ticket. The club needs to raise $1000 to pay for costumes and stage sets. The auditorium has a seating capacity of 240. Write and graph a system of inequalities that can be used to determine how many tickets have to be sold for the club to meet its goal.

$\begin{cases} 8x + 4y \ge 1000 \\ x + y \le 240 \end{cases}$



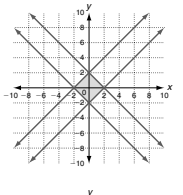
LESSON 3-3

Practice C

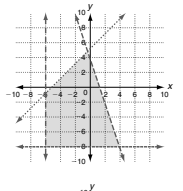
Solving Systems of Linear Inequalities

Graph the system of inequalities, and classify the figure created by the solution region.

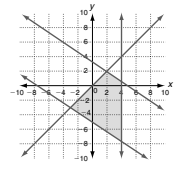
1. $\begin{cases} y \le -x + 2 \\ y \le x + 2 \\ y \ge -x - 2 \\ y \ge x - 2 \end{cases}$ Square



2. $\begin{cases} y < -3x + 4 \\ y > -8 \\ y < x + 5 \\ x > -6 \end{cases}$ Quadrilateral



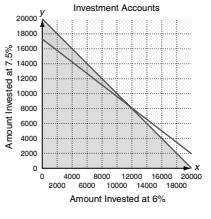
3. $\begin{cases} y \le -\frac{2}{3}x + 3 \\ y \le x \\ y \ge -\frac{2}{3}x - 5 \\ x \le 4 \end{cases}$ Trapezoid



Solve.

4. Anton wants to divide a maximum of $20,000 between two simple interest investment accounts. One pays 6% interest and the other pays 7.5% interest. Write and graph a system of inequalities that shows the amounts Anton can invest in each account and still earn at least $1300 per year.

$\begin{cases} x + y \le 20{,}000 \\ 0.06x + 0.075y \ge 1300 \end{cases}$



LESSON 3-3

Reteach

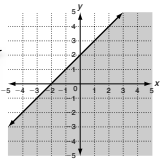
Solving Systems of Linear Inequalities

To use graphs to find the solution to a system of inequalities:

1. Draw the graph of the boundary for the first inequality. Remember to use a solid line for $\le$ or $\ge$ and a dashed line for $<$ or $>$.
2. Shade the region above or below the boundary line that is a solution of the inequality.
3. Draw the graph of the boundary for the second inequality.
4. Shade the region above or below the boundary line that is a solution of the inequality using a different pattern.
5. The region where the shadings overlap is the solution region.

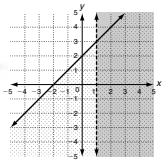
Graph $\begin{cases} y \le x + 2 \\ x > 1 \end{cases}$ Graph $y \le x + 2$.

Graph $y = x + 2$.
Use a solid line for the boundary.
Shade the region below the line.



On the same plane, graph $x > 1$.

Graph $x = 1$.
Use a dashed line for the boundary.
Shade the region to the right of the line.



Check: Test a point in the solution region in both inequalities.
Try (2, 2).

$y \le x + 2$ $\quad x > 1$

$2 \stackrel{?}{\le} 2 + 2 \quad 2 > 1$✓

$4 \le 2$✓

Graph the system of inequalities.

1. $\begin{cases} y > -x + 1 \\ y \le 2 \end{cases}$

a. Shade Above the line for $y > -x + 1$.

b. Shade below the line for $y \le 2$.

c. Check: possible answer: (1, 3)

d. Check: possible answer: (4, 0)