

Name: _____ Date: _____ Period: _____

6-1 Slope of a Line and Slope-intercept Form

Standards

- B.S.ID.C.4 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data
- B.F.IF.C.4 Graph linear, quadratic, absolute value, and piecewise functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated ones.
- B.N.Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

Objective

- SWBAT use linear equations IOT solve problems in context .
- SWBAT write the slope-intercept form of an equation IOT graph the equation.

Key Concepts

_____ - the steepness, or rise over run, or rate of change given by the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$

_____ - the point in which the graph crosses the x -axis.

_____ - the point in which the graph crosses the y -axis.

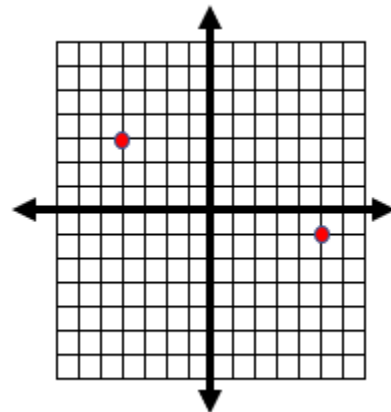
_____ - $y = mx + b$, where $m =$ slope and $(0, b)$ is the y -intercept.

Examples

1. Find the slope of AB containing the points A(-1, 2) and B(3, -4).

2. Find the slope of XY.

3. Graph the line that passes through G(1, 1) and has a slope of $-\frac{3}{4}$.



4. Find the slope and y- intercept.

a. $y = \frac{2}{3}x - 4$

b. $2x + 3y = 6$

5. Write the equation for the line with the given slope and y-intercept.

a. $m = 2, b = -4$

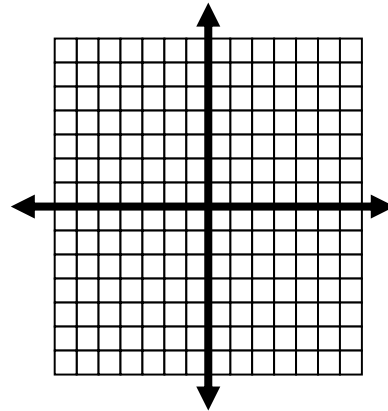
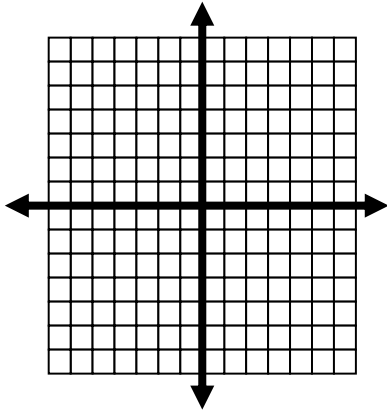
b. $m = 0, b = 1$

c. $m = \frac{3}{4}, b = 0$

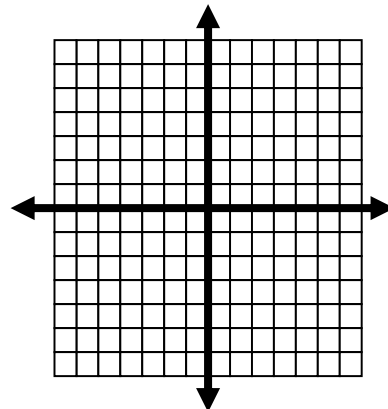
6. Graph the line

a. $-x + y = 3$

b. $2x + 5y = -10$



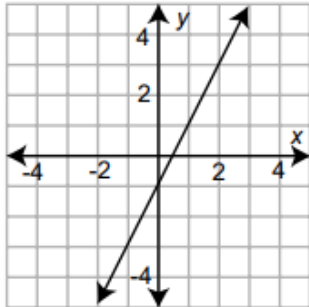
7. Production figures for an assembly plant are represented by a line with a slope of $\frac{1}{2}$ and a y-intercept of -1. Find the equation of the line. Then draw the graph of the line.



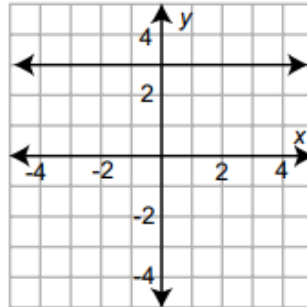
▣ EXERCISES

Find the slope of each line.

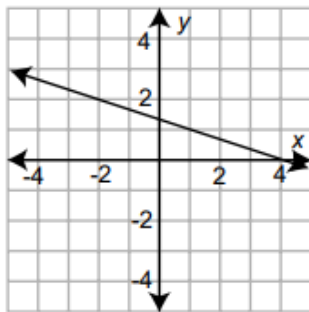
1.



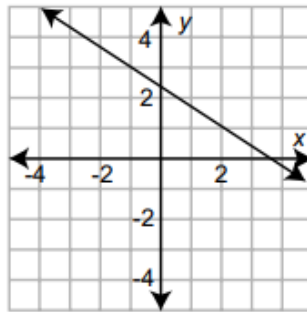
2.



3.



4.



Find the slope of the line containing the given points.

5. $A(-2, 2)$ and $B(0, 4)$ _____

6. $R(5, -1)$ and $S(2, 3)$ _____

7. $M(4, -8)$ and $N(6, -1)$ _____

8. $F(-5, 5)$ and $G(-1, 6)$ _____

Find the slope and y -intercept for each line.

9. $y = 2x + 1$ _____

10. $-4x + y = 2$ _____

11. $y = -1$ _____

12. $3x - 3y = 6$ _____

Write an equation of the line with the given slope and y -intercept.

13. $m = -1, b = 3$ _____

14. $m = 4, b = -2$ _____

Name: _____ Date: _____ Period: _____

6-3 Write Equations for Lines

Standards

- B.S.ID.C.4 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- B.A.CED.A.3 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Objective

- SWBAT write equations for lines in point-slope form IOT solve problems in context.

Key Concepts

_____ - $y - y_1 = m(x - x_1)$ where m = slope and (x_1, y_1) is a point on the line.

_____ - $Ax + By = C$ where A, B and C are integer coefficients.

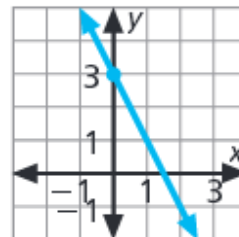
If you know	You can write an equation in
1. The slope m and y-intercept b	1. Slope-intercept form: $y = mx + b$
2. A point (x_1, y_1) and the slope m	2. Point slope form: $y - y_1 = m(x - x_1)$
3. Two points (x_1, y_1) and (x_2, y_2)	3. Point slope form: $y - y_1 = m(x - x_1)$ or $y - y_2 = m(x - x_2)$ where $m = \frac{y_2 - y_1}{x_2 - x_1}$
4. The graph with points $A(x_1, y_1)$ and $B(x_2, y_2)$	4. Same as 3.

Examples

1. Write an equation of the line with a slope of -2 and passes through the point P(-1, 3).

2. Write an equation of the line through A(1, -3) and B(3, 2).

3. Write the equation of the line shown.



4. Write the equation $y = -\frac{1}{2}x + 1$ in standard form.
5. Write the equation of the line parallel to $y = -\frac{1}{3}x + 1$ containing $R(1, 1)$.
6. Write the equation of the line perpendicular to $y = -\frac{1}{3}x + 1$ containing $R(1, 1)$.
7. The temperature of water at the freezing point is 0°C or 32°F . The temperature of water at the boiling point is 100°C or 212°F . Use these two data points to find an equation to convert the temperature from Celsius to Fahrenheit.

-----Lesson 6-3 Independent Practice/Lesson Check-----

EXERCISES

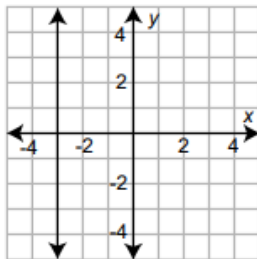
Write an equation of the line with the given slope and y -intercept.

1. $m = -2, b = 4$ _____
2. $m = -\frac{2}{5}, b = 1$ _____
3. $m = -5, b = -2$ _____
4. $m = 1, b = \frac{3}{4}$ _____

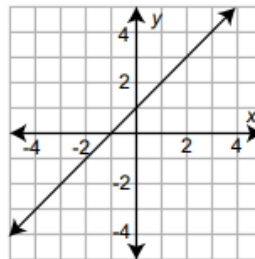
Write an equation of the line with the given information.

5. $m = 0, C(-1, 4)$ _____
6. $m = \frac{1}{3}, W(\frac{1}{2}, 2)$ _____
7. m is undefined, $T(5, -6)$ _____
8. $m = -4, S(\frac{3}{5}, -\frac{1}{5})$ _____
9. $A(3, -1)$ and $B(2, 4)$ _____
10. $M(-6, 4)$ and $N(0, -5)$ _____
11. $R(6, -1)$ and $S(-3, 0)$ _____
12. $F(1, -8)$ and $G(3, 2)$ _____

13.



14.



15. Parallel to $x + y = 4$ and passes through $M(3, 2)$. _____

Name: _____ Date: _____ Period: _____

6-4 Systems of Equations

Standards

- B.A.REI.C.3 Solve and explain the solutions to a system of equations using a variety of representations including combinations of linear and non-linear equations.
- B.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities.

Objective

- SWBAT use graphical means IOT solve a linear system of equations.
- SWBAT analyze a system IOT determine the number of solutions.

Key Concepts

_____ - two linear equations with the same two variables

_____ - the point of intersection of the lines in the system.

_____ - systems that have lines intersecting at one point.

_____ - systems in which the lines coincide and every point on the line is a solution. This system has infinitely many solutions.

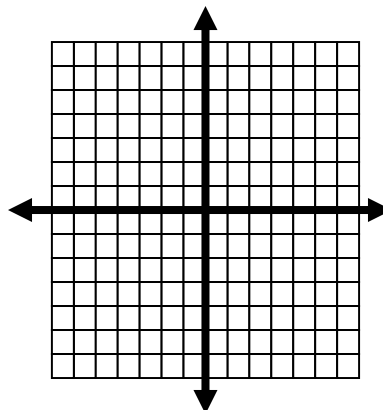
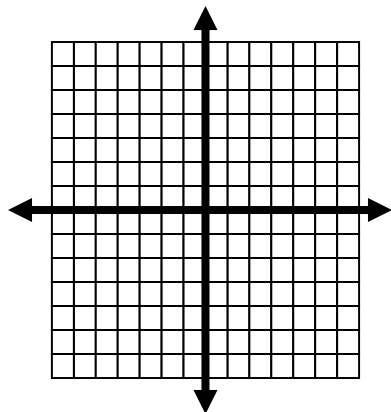
_____ - systems that have lines that do not intersect.

Examples

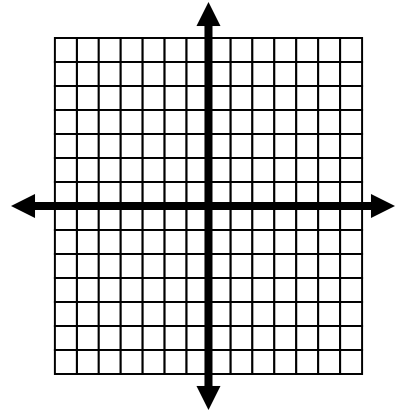
1. (I do) Solve the system by graphing.

a.
$$\begin{cases} y = -2x + 1 \\ y = -3x + 4 \end{cases}$$

b.
$$\begin{cases} y = \frac{1}{2}x + 3 \\ 2y = x - 2 \end{cases}$$



2. (We do) Use technology to graph.
$$\begin{cases} 4x + 2y = 8 \\ 6x + 3y = 12 \end{cases}$$



3. (We do) Determine whether (2, 1) is a solution of the system
$$\begin{cases} 5y = 3x - 1 \\ 2x - 3y = 1 \end{cases}$$

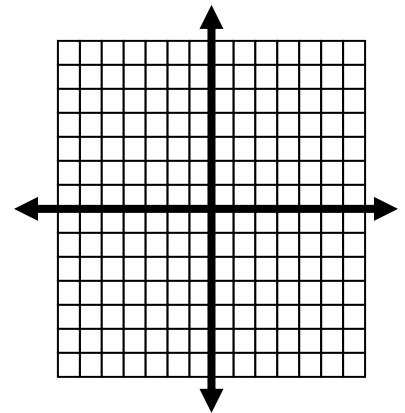
4. (We do) Determine the number of solutions for the system. Do not graph.

a.
$$\begin{cases} 4x + 5y = 3 \\ 3x - 2y = 8 \end{cases}$$

b.
$$\begin{cases} x + y = 3 \\ 2x + 2y = 6 \end{cases}$$

c.
$$\begin{cases} 4x + 5y = 3 \\ y = -\frac{4}{5}x - 1 \end{cases}$$

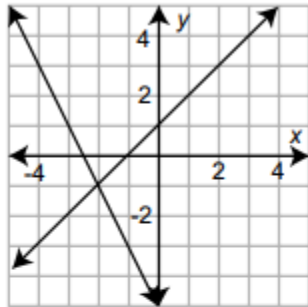
5. (They Do) The sum of 2 numbers is -3. Their difference is 13.
Find the numbers by writing a system of equations and solving
by graphing.



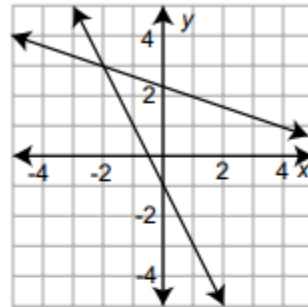
EXERCISES

Determine the solution of each system of equations.

1.



2.



Solve each system of equations by graphing. Use your own paper.

3. $\begin{cases} 4x - y = 5 \\ 2x + y = 7 \end{cases}$ _____

4. $\begin{cases} 3x + y = -2 \\ x = y - 2 \end{cases}$ _____

5. $\begin{cases} y = 5x + 2 \\ x = 6 - 3y \end{cases}$ _____

6. $\begin{cases} \frac{x}{2} + \frac{y}{3} = 1 \\ y = \frac{x}{4} - 4 \end{cases}$ _____

7. $\begin{cases} 3x + 2y = 4 \\ y = 2x + 9 \end{cases}$ _____

8. $\begin{cases} x = y - 6 \\ \frac{x}{2} + \frac{y}{2} = -3 \end{cases}$ _____

9. The sum of two numbers is 2. Their difference is 10. Find the numbers. _____

10. One number is three times another number. The difference of the two numbers is 2. Find the numbers. _____

Name: _____ Date: _____ Period: _____

6-5 Solving Systems of Equations by Substitution

Standards

- B.A.REI.C.3 Solve and explain the solutions to a system of equations using a variety of representations including combinations of linear and non-linear equations.
- B.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities.

Objective

- SWBAT use substitution IOT solve a linear system of equations.

Key Concepts

_____ - If $a = b$, a may replace b in any mathematical expression.
This method can be used to solve systems of equations.

Examples

1. (I do) Solve the system using substitution.

a.
$$\begin{cases} 3x - y = 6 \\ x = -2y + 2 \end{cases}$$

b.
$$\begin{cases} x + 3y = -9 \\ -5x - 2y = -7 \end{cases}$$

2. (We do) Solve the system using substitution.

a.
$$\begin{cases} 2x + 3y = 6 \\ 4x + 6y = 6 \end{cases}$$

b.
$$\begin{cases} 4x - 2y = 10 \\ -2x + y = -5 \end{cases}$$

3. (They do) An appliance store delivers large appliances using vans and trucks. When loaded, each van holds 4 appliances and each truck holds 6 appliances. If 42 appliances are delivered by 8 full vehicles, how many vans and trucks are used?

-----Lesson 6-5 Independent Practice/Lesson Check-----

▣ **EXERCISES**

Solve each system of equations by the substitution method. Check the solution.

1. $\begin{cases} x + y = 4 \\ 2x - y = 5 \end{cases}$ _____

2. $\begin{cases} 5x + y = 0 \\ x - 2y = 11 \end{cases}$ _____

3. $\begin{cases} -4x + 2y = 8 \\ 2x + 2y = 6 \end{cases}$ _____

4. $\begin{cases} 2x + \frac{1}{2}y = 25 \\ -x - y = 10 \end{cases}$ _____

15. Ryan has 10 coins consisting of dimes and nickels worth \$0.70. How many dimes and how many nickels does he have? _____

16. Brooke spent \$94.92 at the music store. She bought some cassette tapes for \$9.99 each and some CDs for \$12.99 each. How many cassette tapes and how many CDs did she buy if she bought 8 all together? _____

Name: _____ Date: _____ Period: _____

6-6 Solving Systems of Equations by Elimination (Adding & Multiplying)

Standards

- B.A.REI.C.3 Solve and explain the solutions to a system of equations using a variety of representations including combinations of linear and non-linear equations.
- B.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities.

Objective

- SWBAT use elimination IOT solve a linear system of equations.

Key Concepts

_____ - using the Addition Property of Equality or using additive inverses to cancel a variable.

Examples

1. (I do) Solve the system using elimination.

a.
$$\begin{cases} x - y = -5 \\ x + y = 1 \end{cases}$$

b.
$$\begin{cases} 2x + 7y = -5 \\ -5x + 7y = -12 \end{cases}$$

2. (We do) Solve the system using elimination.

a.
$$\begin{cases} 3x - 4y = 10 \\ 3y = 2x - 7 \end{cases}$$

b.
$$\begin{cases} 3x - 5y = -1 \\ 6x = -2y + 10 \end{cases}$$

3. (They do) Rodrick sold 25 movie tickets for a total of \$132. If each adult ticket sold for \$6 and each children's ticket sold for \$4. How many of each kind did he sell?

-----Lesson 6-6 Independent Practice/Lesson Check-----

EXERCISES

Solve each system of equations. Check the solution.

1. $\begin{cases} 2x - y = 4 \\ x + 2y = 7 \end{cases}$ _____

2. $\begin{cases} 3x - y = 4 \\ 4y = -2x + 12 \end{cases}$ _____

3. $\begin{cases} x = 3y - 6 \\ 6y = x + 3 \end{cases}$ _____

4. $\begin{cases} -x + 3y = 8 \\ y = 2x - 4 \end{cases}$ _____

5. $\begin{cases} 6x + 6y = 6 \\ x + y = 1 \end{cases}$ _____

6. $\begin{cases} 5x - y = 4 \\ 3x = -2y + 18 \end{cases}$ _____

7. $\begin{cases} 3y = 2x - 9 \\ 6x + 13 = y \end{cases}$ _____

8. $\begin{cases} 10x + 5y = 20 \\ x = y + 2 \end{cases}$ _____

9. The perimeter of a rectangle is 24 in. The length is twice the width. Find the dimensions. _____

Name: _____ Date: _____ Period: _____

6-7 Solving Systems of Equations using Matrices

Standards

- B.A.REI.C.3 Solve and explain the solutions to a system of equations using a variety of representations including combinations of linear and non-linear equations.
- B.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities.

Objective

- SWBAT use matrices IOT solve a linear system of equations.

Key Concepts

_____ - a rectangular array of elements.

Examples

1. (I do) Solve the system using matrices.

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

b.
$$\begin{cases} x + 3y = 4 \\ -2x + y = -1 \end{cases}$$

2. (We do) Solve the system using a matrix
$$\begin{cases} 3x - y = 2 \\ 2y = -x - 4 \end{cases}$$

3. (They do) Enterprise Rental charges \$25 per day plus \$0.35 per mile. Avis charges \$35 per day plus \$0.25 per mile. Carter determines the trip he needs to take will cost \$230 with Enterprise and \$250 with Avis. How many miles and for how many days will Carter's trip be?

-----Lesson 6-7 Independent Practice/Lesson Check-----

▣ EXERCISES

For each system of equations, **a.** write the matrix equation and **b.** solve using the method of determinants.

1. $\begin{cases} -3x + 4y = 12 \\ x - 2y = 6 \end{cases}$ **a.** _____ **b.** _____

2. $\begin{cases} 5x + y = 10 \\ x - y = 5 \end{cases}$ **a.** _____ **b.** _____

3. $\begin{cases} x - y = 16 \\ x + y = 10 \end{cases}$ **a.** _____ **b.** _____

4. $\begin{cases} 2x - 2y = 8 \\ -x + 3y = 12 \end{cases}$ **a.** _____ **b.** _____

Name: _____ Date: _____ Period: _____

6-8 Linear Systems of Inequalities

Standards

- B.A.CED.A.1 Create equations and inequalities in one variable and use them to solve real world problems.
- B.A.REI.C.3 Solve and explain the solutions to a system of equations using a variety of representations including combinations of linear and non-linear equations.
- B.A.REI.D.5 Solve a linear inequality using multiple methods and interpret the solution as it applies to the context.

Objective

- SWBAT model a real-world situation using systems of linear inequalities.
- SWBAT use graphs to solve a system of linear inequalities.

Key Concepts

_____ - two or more inequalities with the same variables.

_____ - the intersection of the graphs of the inequalities.

Examples

1. (I do) Determine whether the given ordered pair is a solution to the given system of inequalities.

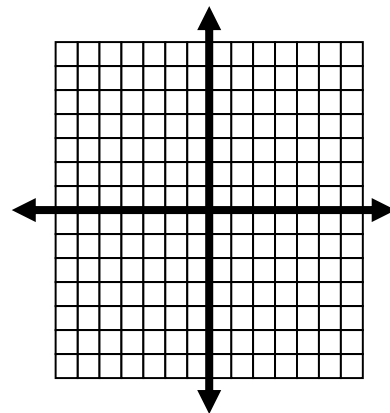
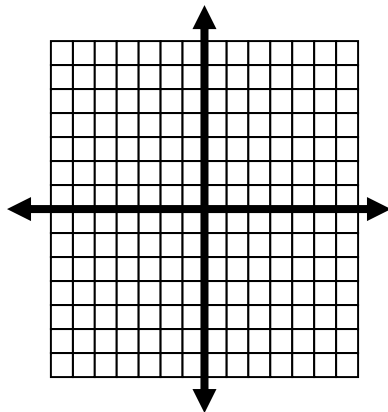
a. $(2, -5); \begin{cases} 4x - y \geq 5 \\ 8x + 5y \leq 3 \end{cases}$

b. $(1, 2); \begin{cases} x + y \geq 3 \\ 3x - y < 1 \end{cases}$

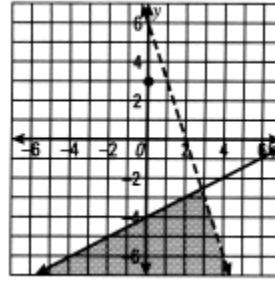
2. (We do) Graph the solution set to the system.

a. $\begin{cases} 2x - 3y \leq 6 \\ x + 2y < 2 \end{cases}$

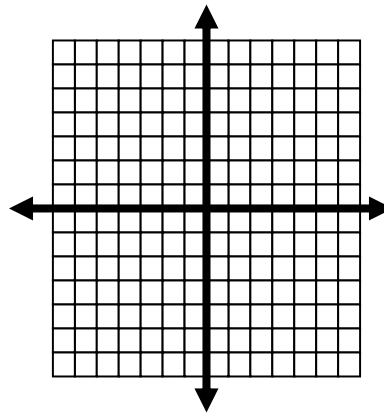
b. $\begin{cases} y \geq 2x + 5 \\ x - \frac{1}{3}y < 1 \end{cases}$



3. (We do) Write a system of inequalities for the graph.



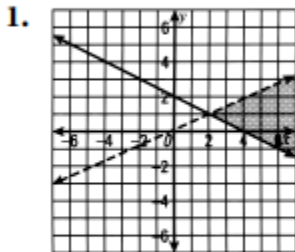
4. (They do) Jasmine needs to earn at least \$100 this week. She earns \$6 per hour doing gardening and \$8 per hour as a part-time receptionist. She has only 18 h available to work during the week. Write and graph a system of linear inequalities that models the weekly number of hours Jasmine can work at each job and how much money she needs to earn.

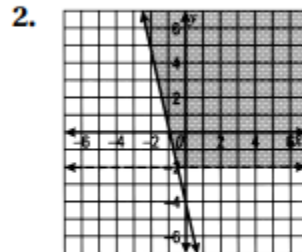


-----Lesson 6-8 Independent Practice/Lesson Check-----

EXERCISES

Write a system of linear inequalities for each graph.





Graph the solution set of each system of linear inequalities on another sheet of paper.

3.
$$\begin{cases} x > 2 \\ y > 4 \end{cases}$$

4.
$$\begin{cases} x < y + 1 \\ 3 \leq -x - y \end{cases}$$

5.
$$\begin{cases} x + y \geq 0 \\ y - x < 4 \end{cases}$$