

# 5.1 Solving Systems of Equations by Graphing

- Objectives:** 1. Identify solutions of linear equations in two variables.  
2. Solve systems of linear equations in two variables by graphing.

A linear system of equations is a set of two or more linear equations containing two or more variables. A solution of the system of linear equations with two variables is an ordered pair that satisfies **each equation** in the system. So, if an ordered pair is a solution, it will make **both equations true**.

**Tell whether the ordered pair is a solution of the given system.**

1.  $(5, 2); \begin{cases} \frac{2}{5}x - y = 0 \\ 3x - y = 13 \end{cases}$  *yes*

$$\frac{2}{5}(5) - 2 = 0 \quad 3(5) - 2 = 13$$

$$2 - 2 = 0 \quad 15 - 2 = 13$$

$$0 = 0 \quad 13 = 13$$

2.  $(-2, 2); \begin{cases} x + 3y = 4 \\ -x + y = 2 \end{cases}$  *NO*

$$-2 + 3(2) = 4 \quad -(-2) + 2 = 2$$

$$-2 + 6 = 4 \quad 2 + 2 = 2$$

$$4 = 4 \quad 4 = 2$$

3.  $(1, 3); \begin{cases} 2x + y = 5 \\ -2x + y = 1 \end{cases}$  *yes*

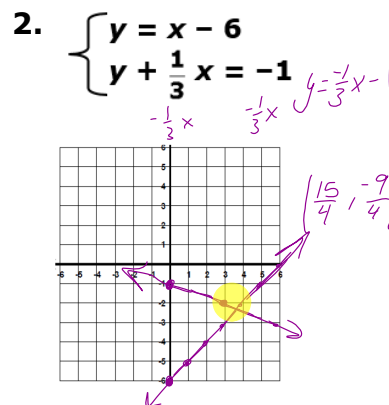
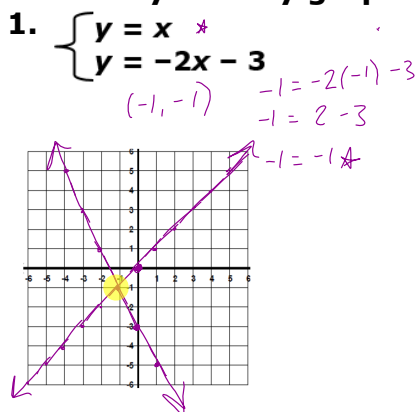
$$2(1) + 3 = 5 \quad -2(1) + 3 = 1$$

$$2 + 3 = 5 \quad -2 + 3 = 1$$

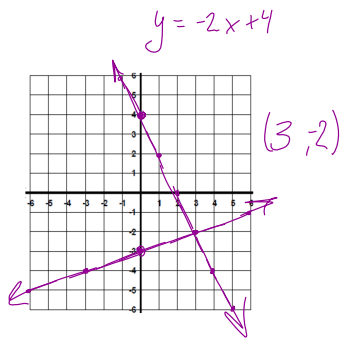
$$5 = 5 \quad 1 = 1$$

All solutions of a linear equation are on its graph. To find a solution of a system of linear equations, you need a point that each line has in common. In other words, you need their Point of intersection.

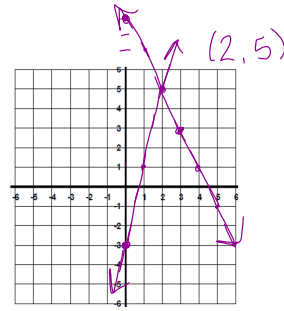
**Solve the system by graphing. Check your answer.**



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



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



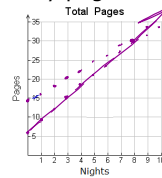
Wren and Jenni are reading the same book. Wren is on page 14 and reads 2 pages every night. Jenni is on page 6 and reads 3 pages every night. After how many nights will they have read the same number of pages? How many pages will that be?

Wren  
 $y = 2x + 14$

$y = \text{pages}$   
 $x = \text{nights}$

Jenni  
 $y = 3x + 6$

8 nights 30 pages



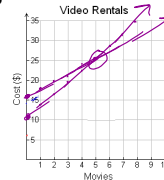
Video club A charges \$10 for membership and \$3 per movie rental. Video club B charges \$15 for membership and \$2 per movie rental. For how many movie rentals will the cost be the same at both video clubs? What is that cost?

A  
 $y = 3x + 10$

B  
 $y = 2x + 15$

$y = \text{cost}$   
 $x = \text{movies}$

5 movies  
\$25



Joy has 5 collectable stamps and will buy 2 more each month. Ronald has 25 collectable stamps and will sell 3 each month. After how many months will they have the same number of stamps? How many will that be?

Joy  $y = 2x + 5$  Ronald  $y = -3x + 25$

$y = \text{stamps}$   
 $x = \text{months}$

$2(2) + 5 = 9$   
 $4 + 5 = 9$

$2(2) + 5 = 9$   
 $4 + 5 = 9$

$2(3) + 5 = 11$   
 $6 + 5 = 11$

Joy	
X	Y
<del>2</del>	<del>9</del>
<del>3</del>	<del>11</del>
4	13

Ronald	
X	Y
<del>2</del>	<del>19</del>
<del>3</del>	<del>16</del>
4	13

$-3(2) + 25 = 19$

$-6 + 25 = 19$

$19$

$-3(3) + 25 = 16$

$-9 + 25 = 16$

$16$

$-3(4) + 25 = 13$

$-12 + 25 = 13$

## 5.2 Solving Systems by Substitution

**Objective:** Solve system of linear equations in one variable using substitution.

Sometimes it is difficult to identify the exact solution to a system by graphing. In this case, you can use a method called Substitution.

Solving Systems of Equations by Substitution	
Step 1	Solve for 1 variable in @ least 1 equation.
Step 2	Substitute resulting expression into the other equation
Step 3	Solve the equation for the value of the remaining variable
Step 4	Substitute the value into an original equation to find the 2nd value
Step 5	Write the values from step 3 and 4 as an ordered pair (x, y) and check

Solve the system by substitution.

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

$y = 3(-1)$   
 $y = -3$

$$\begin{array}{r} 3x = x - 2 \\ -x \quad -x \\ \hline 2x = -2 \\ \frac{2x}{2} = \frac{-2}{2} \\ x = -1 \end{array}$$

$(-1, -3)$

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

$y = 1 + 1$   
 $y = 2$

$$\begin{array}{r} 4x + x + 1 = 6 \\ 5x + 1 = 6 \\ -1 \quad -1 \\ \hline 5x = 5 \\ \frac{5x}{5} = \frac{5}{5} \\ x = 1 \end{array}$$

$(1, 2)$

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

$x = y + 5$

$$\begin{array}{r} y + 5 + 2y = -1 \\ 3y + 5 = -1 \\ -5 \quad -5 \\ \hline 3y = -6 \\ \frac{3y}{3} = \frac{-6}{3} \\ y = -2 \end{array}$$

$x = -2 + 5$   
 $x = 3$

$(3, -2)$

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

$y = -x - 7$

$$\begin{array}{r} 2x + -x - 7 = -4 \\ x - 7 = -4 \\ +7 \quad +7 \\ \hline x = 3 \end{array}$$

$y = -3 - 7$   
 $y = -10$

$(3, -10)$

5. 
$$\begin{cases} x = 6y - 11 \\ 3x - 2y = -1 \end{cases}$$

$$3(6y - 11) - 2y = -1 \quad x = 6(2) - 11$$

$$18y - 33 - 2y = -1 \quad x = 12 - 11$$

$$16y - 33 = -1 \quad x = 1$$

$$16y - 33 = -1 \quad +33 \quad +33$$

$$\frac{16y}{16} = \frac{32}{16} \quad y = 2$$

(1, 2)

6. 
$$\begin{cases} -2x + y = 8 \\ 3x + 2y = 9 \end{cases}$$

$$3x + 2(2x + 8) = 9$$

$$3x + 4x + 16 = 9$$

$$7x + 16 = 9$$

$$7x = -7$$

$$x = -1$$

$$y = 2(-1) + 8$$

$$y = -2 + 8$$

$$y = 6$$

(-1, 6)

7. 
$$\begin{cases} y + 6x = 11 \\ 3x + 2y = -5 \end{cases}$$

$$y = -6x + 11$$

$$3x + 2(-6x + 11) = -5$$

$$3x - 12x + 22 = -5$$

$$-9x + 22 = -5$$

$$-9x = -27$$

$$x = 3$$

$$y = -6(3) + 11$$

$$y = -18 + 11$$

$$y = -7$$

(3, -7)

$(-\frac{3}{2}, -\frac{11}{2})$

8. 
$$\begin{cases} -3x + y = -1 \\ x - y = 4 \end{cases}$$

$$x - (3x - 1) = 4$$

$$x - 3x + 1 = 4$$

$$-2x + 1 = 4$$

$$-2x = 3$$

$$x = -\frac{3}{2}$$

$$y = 3(-\frac{3}{2}) - 1$$

$$y = -\frac{9}{2} - 1$$

$$y = -\frac{9}{2} - \frac{2}{2}$$

$$y = -\frac{11}{2}$$

Jenna is deciding between two cell-phone plans. The first plan has a \$50 sign-up fee and costs \$20 per month. The second plan has a \$30 sign-up fee and costs \$25 per month. After how many months will the total costs be the same? What will the costs be? If Jenna has to sign a one-year contract, which plan will be cheaper? Explain.

$$y = 20x + 50$$

$$y = 25x + 30$$

$$20x + 50 = 25x + 30$$

$$-20x \quad -20x$$

$$50 = 5x + 30$$

$$-30 \quad -30$$

$$\frac{20}{5} = \frac{5x}{5}$$

$$4 = x$$

(4 months, \$130)

$$y = 20(4) + 50$$

$$y = 80 + 50$$

$$y = \$130$$

$$y = 25(4) + 30$$

$$y = 100 + 30$$

$$y = \$130$$

First plan is cheaper by \$40.

One cable television provider has a \$60 setup fee and charges \$80 per month, and the second has a \$160 equipment fee and charges \$70 per month. Same questions as above.

$$y = 80x + 60$$

$$y = 70x + 160$$

$$80x + 60 = 70x + 160$$

$$-70x \quad -70x$$

$$10x + 60 = 160$$

$$-60 \quad -60$$

$$\frac{10x}{10} = \frac{100}{10}$$

$$x = 10 \text{ months}$$

$$y = \$860$$

$$y = 80(10) + 60$$

$$y = 800 + 60$$

$$y = \$860$$

$$y = 70(10) + 160$$

$$y = 700 + 160$$

$$y = \$860$$

Second cable provider is cheaper after a year.

# 5.3 Solving Systems by Elimination

- Objectives: 1. Solve system of linear equations in two variables by elimination.  
 2. Compare and choose an appropriate method for solving systems of linear equations.

Another method for solving systems of equations is elimination. Like substitution, the goal of elimination is to get one equation that has only one variable.

Solving Systems of Equations by Elimination	
<b>Step 1</b>	Write the system so all the terms are aligned
<b>Step 2</b>	Eliminate 1 variable and solve for the value of the other.
<b>Step 3</b>	Substitute value into an original equation and solve for the value of the remaining variable
<b>Step 4</b>	Write the values from step 2 and 3 as an ordered pair (x, y) and check.

Solve the system by elimination.

1. 
$$\begin{cases} 3x - 4y = 10 \\ x + 4y = -2 \end{cases}$$

\* Opposite signs  
\* Same coefficient

$$\begin{array}{r} 4x + 0 = 8 \\ \hline 4x = 8 \\ \hline x = 2 \end{array}$$

(2, -1)

$$\begin{array}{r} 2 + 4y = -2 \\ -2 \\ \hline 4y = -4 \\ \hline y = -1 \end{array}$$

3. 
$$\begin{cases} 2x + y = -5 \\ 2x - 5y = 13 \end{cases}$$

$$\begin{array}{r} -2x - y = 5 \\ + 2x - 5y = 13 \\ \hline 0 - 6y = 18 \\ \hline -6y = 18 \\ \hline -6 \quad -6 \\ \hline y = -3 \end{array}$$

$$\begin{array}{r} 2x + -3 = -5 \\ 2x - 3 = -5 \\ +3 \quad +3 \\ \hline 2x = -2 \\ \hline x = -1 \end{array}$$

(-1, -3)

2. 
$$\begin{cases} y + 3x = -2 \\ 2y - 3x = 14 \end{cases}$$

$$\begin{array}{r} 3y + 0 = 12 \\ \hline 3y = 12 \\ \hline y = 4 \end{array}$$

(-2, 4)

$$\begin{array}{r} 4 + 3x = -2 \\ -4 \\ \hline 3x = -6 \\ \hline x = -2 \end{array}$$

4. 
$$\begin{cases} 8x + 3y = 15 \\ -2x + 3y = -5 \end{cases}$$

$$\begin{array}{r} -3x - 3y = -15 \\ + -2x + 3y = -5 \\ \hline -5x + 0 = -20 \\ \hline -5x = -20 \\ \hline -5 \quad -5 \\ \hline x = 4 \end{array}$$

$$\begin{array}{r} 3(4) + 3y = 15 \\ 12 + 3y = 15 \\ -12 \quad -12 \\ \hline 3y = 3 \\ \hline y = 1 \end{array}$$

(4, 1)

5. 
$$\begin{cases} x + 2y = 11 \\ -3x + y = -5 \end{cases} (-2)$$

$$\begin{array}{r} x + 2y = 11 \\ + 6x - 2y = 10 \\ \hline 7x = 21 \\ x = 3 \end{array} \quad \begin{array}{r} 3 + 2y = 11 \\ -3 \quad y = -3 \\ \hline 2y = 8 \\ y = 4 \end{array}$$

$(3, 4)$

7. 
$$\begin{cases} 3x + 2y = 6 \\ -x + y = -2 \end{cases} (3)$$

$$\begin{array}{r} 3x + 2y = 6 \\ -3x + 3y = -6 \\ \hline 5y = 0 \\ y = 0 \end{array}$$

$$\begin{array}{r} -x + 0 = -2 \\ -x = -2 \\ x = 2 \end{array}$$

$(2, 0)$

6. 
$$\begin{cases} -5x + 2y = 32 \\ 2x + 3y = 10 \end{cases} (3)$$

$$\begin{array}{r} -15x + 6y = 96 \\ + -4x - 6y = -20 \\ \hline -19x = 76 \\ x = -4 \end{array} \quad \begin{array}{r} -5(-4) + 2y = 32 \\ 20 + 2y = 32 \\ -20 \quad -2y = -26 \\ \hline 2y = 12 \\ y = 6 \end{array}$$

$(-4, 6)$

8. 
$$\begin{cases} 2x + 5y = 26 \\ -3x - 4y = -25 \end{cases} (3)$$

$$\begin{array}{r} 6x + 15y = 78 \\ -6x - 8y = -50 \\ \hline 7y = 28 \\ y = 4 \end{array}$$

$$\begin{array}{r} -3x - 4(4) = -25 \\ -3x - 16 = -25 \\ +16 \quad +16 \\ -3x = -9 \\ x = 3 \end{array}$$

$(3, 4)$

Paige has \$7.75 to buy 12 sheets of felt and card stock for her scrapbook. The felt costs \$0.50 per sheet, and the card stock costs \$0.75 per sheet. How many sheets of each can Paige buy?

$x = \text{felt}$   
 $y = \text{card stock}$

$$\begin{cases} 7.75 = .5x + .75y \\ 12 = x + y \end{cases} (-.5)$$

$$\begin{array}{r} 7.75 = .5x + .75y \\ + -6 = -.5x - .5y \\ \hline 1.75 = .25y \\ .25 \quad .25 \\ \hline 7 = y \end{array}$$

$$\begin{array}{r} 12 = x + 7 \\ -7 \quad -7 \\ \hline 5 = x \end{array}$$

Harlan has \$44 to buy 7 pairs of socks. Athletic socks cost \$5 per pair. Dress socks cost \$8 per pair. How many pairs of each can Harlan buy?

$x = \text{athletic}$   
 $y = \text{dress}$

$$\begin{cases} 44 = 5x + 8y \\ 7 = x + y \end{cases} (-5)$$

$$\begin{array}{r} 44 = 5x + 8y \\ -35 = 5x - 5y \\ \hline 9 = 3y \\ 3 \quad 3 \\ \hline 3 = y \end{array}$$

$$\begin{array}{r} 7 = x + 3 \\ -3 \quad -3 \\ \hline 4 = x \end{array}$$

## 5.4 Solving Special Systems

**Objectives:** 1. Solve special systems of linear equations in two variables.  
2. Classify systems of linear equations and determine the number of solutions.

Systems with at least one solution are called consistent.

When the two lines in a system do not intersect they are parallel lines. There are no ordered pairs that satisfy both equations, so there is no solution. A system that has no solution is an

inconsistent system.

**Show that the system has no solution.**

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

$$-x + x - 4 = 3$$

$$-4 = 3$$

No  
Solution

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

$$2x - 2x + 5 = 1$$

$$5 = 1$$

No  
Solution

If two linear equations in a system have the same graph, the graphs are the same line. There are infinitely many solutions of the system because every point on the line represents a solution of both equations.

**Show that the system has infinitely many solutions.**

$$1. \begin{cases} y = 3x + 2 \\ 3x - y + 2 = 0 \end{cases}$$

$$3x - (3x + 2) + 2 = 0$$

$$3x - 3x - 2 + 2 = 0$$

$$0 + 0 = 0$$

infinitely many  
solutions

$$2. \begin{cases} y = x - 3 \\ x - y - 3 = 0 \end{cases}$$

$$x - (x - 3) - 3 = 0$$

$$x - x + 3 - 3 = 0$$

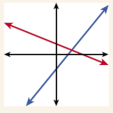

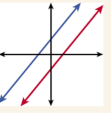
$$0 + 0 = 0$$

Infinitely Many  
Solutions

Consistent systems can either be independent or dependent.

An independent system has exactly one solution. The graph of an independent system consists of two intersecting lines.

A dependent system has infinitely many solutions. The graph of a dependent system consists of two coincident lines.

Classification of Systems of Linear Equations			
CLASSIFICATION	CONSISTENT AND INDEPENDENT	CONSISTENT AND DEPENDENT	INCONSISTENT
Number of Solutions	Exactly one	Infinitely many	None
Description	Different slopes	Same slope, same y-intercept	Same slope, different y-intercepts
Graph	Intersecting lines 	Coincident lines 	Parallel lines 

Classify the system. Give the number of solutions.

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

$$y = \frac{1}{3}x + 1$$

$$y = \frac{1}{3}x + 1$$
 Consistent and dependent  
 \* infinitely many solutions

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

$$y = -x + 5$$

$$y = -x - 4$$
 Parallel lines  
 Inconsistent  
 No Solution

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

$$y = 4x + 4$$

$$y = x + 3$$
 Consistent Independent  
 Exactly One Solution

4. 
$$\begin{cases} x + 2y = -4 \\ -2(y + 2) = x \end{cases}$$

$$y = -\frac{1}{2}x - 2$$

$$y = -\frac{1}{2}x - 2$$
 Consistent and Dependent  
 Infinitely Many Solutions

5. 
$$\begin{cases} y = -2(x - 1) \\ y = -x + 3 \end{cases}$$

$$y = -2x + 2$$

$$y = -x + 3$$
 Consistent + Independent  
 One Solution

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

$$-3y = -2x + 6$$

$$-3y = -2x + 6$$

$$y = \frac{2}{3}x - 2$$

$$y = \frac{2}{3}x$$
 Parallel  
 Inconsistent  
 No Solution

Jared and David both started a savings account in January. If the pattern of savings in the table continues, when will the amount in Jared's account equal the amount in David's account?

	Jan	Feb	Mar	Apr	May
Jared	25	30	35	40	45
David	40	45	50	55	60

$y = 5x + 25$   
 $y = 5x + 40$   
 Never, because they are parallel. Both increasing the same amount.

Matt has \$100 in a checking account and deposits \$20 per month. Ben has \$80 in a checking account and deposits \$30 per month. Will the accounts ever have the same balance? Explain.

$y = 20x + 100$   
 $y = 30x + 80$   
 Yes, different slopes mean they will eventually intersect.



## 5.5 Solving Linear Inequalities

**Objective:** Graph and solve linear inequalities in two variables.

A linear inequality is similar to a linear equation, but the equal sign is replaced with an inequality symbol. A solution of a linear inequality is any ordered pair that makes the inequality true.

**Tell whether the ordered pair is a solution of the inequality.**

1.  $(-2, 4); y < 2x + 1$       2.  $(3, 1); y > x - 4$       3.  $(4, 5); y < x + 1$

	$x \ y$			
		$4 < 2(-2) + 1$	$1 > 3 - 4$	$5 < 4 + 1$
False		$4 < -4 + 1$	$1 > -1$	$5 < 5$
statement		$4 < -3$	True	False
		No	Yes	No

**Solid**  
 $\leq \geq$

When the inequality is written as  $y \leq$  or  $y \geq$ , the points on the boundary line are solutions of the inequality, and the line is **solid**.

When the inequality is written as  $y >$  or  $y \geq$ , the points **above** the boundary line are solutions of the inequality.

When the inequality is written as  $y <$  or  $y >$ , the points on the boundary line are not solutions of the inequality, and the line is **dashed**.

When the inequality is written as  $y <$  or  $y \leq$ , the points **below** the boundary line are solutions of the inequality.

**dashed**  
 $< >$

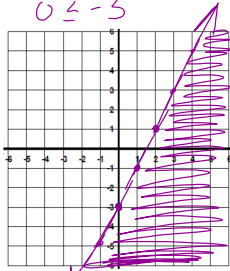
Graphing Linear Inequalities	
Step 1	Solve the inequality for $y$ . Slope-intercept form
Step 2	Graph the boundary line. Solid: $\leq \geq$ dashed: $< >$
Step 3	Shade the plane (area) with solutions above      below $y >$ or $y \geq$ $y <$ or $y \leq$

Pick a Point  
shade where  
it's true

**Graph the solutions of the linear inequality.**

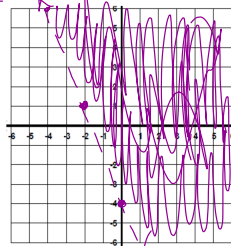
**1.  $y \leq 2x - 3$**

$0 \leq 2(0) - 3$   
 $0 \leq -3$



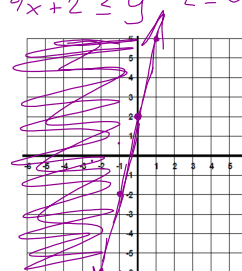
**2.  $5x + 2y > -8$**

$\frac{2y}{2} > \frac{-5x - 8}{2}$   
 $y > -\frac{5}{2}x - 4$   
 $0 > -4$



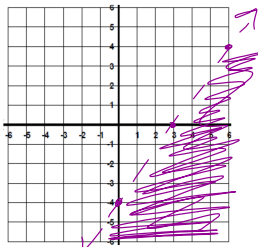
**3.  $4x - y + 2 \leq 0$**

$4x + 2 \leq y$   
 $2 \leq 0$



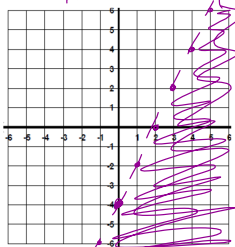
**4.  $4x - 3y > 12$**

$-\frac{3y}{-3} > \frac{-4x + 12}{-3}$   
 $y < \frac{4}{3}x - 4$



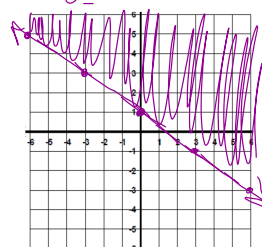
**5.  $2x - y - 4 > 0$**

$2x - 4 > y$   
 $2(0) - 4 > 0$   
 $-4 > 0$



**6.  $y \geq -\frac{2}{3}x + 1$**

$0 \geq -\frac{2}{3}(0) + 1$   
 $0 \geq 1$



$y < \frac{4}{3}x - 4$   
 $0 < \frac{4}{3}(0) - 4$   
 $0 < -4$

Ada has at most 285 beads to make jewelry. A necklace requires 40 beads, and a bracelet requires 15 beads.

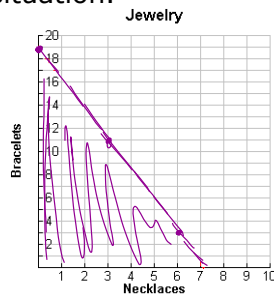
a. Write a linear inequality to describe the situation.

$285 \geq 40x + 15y$   
 $\frac{285 - 40x}{15} \geq \frac{15y}{15}$

b. Graph the solutions.  $19 - \frac{8}{3}x \geq y$

c. Give two combinations of necklaces and bracelets that Ada could make.

$(2, 12)$      $(3, 8)$



Dirk is going to bring two types of olives to the Honor Society induction and can spend no more than \$6. Green olives cost \$2 per pound and black olives cost \$2.50 per pound.

a. Write a linear inequality to describe the situation.

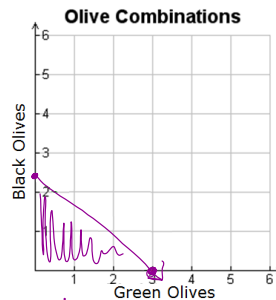
$6 \geq 2x + 2.5y$

b. Graph the solutions.

$-\frac{2}{2.5}x + \frac{6}{2.5} \geq \frac{2.5y}{2.5}$   
 $-\frac{4}{5}x + 2.4 \geq y$   
 $6 \geq 2x + 2.5(0)$   
 $3 \geq x$

c. Give two combinations of olives that Dirk could buy.

$(1, 1)$      $(0, 2)$



## 5.6 Solving Systems of Linear Inequalities

**Objective:** Graph and solve systems of linear inequalities in two variables.

A system of linear inequalities is a set of two or more linear inequalities containing two or more variables. The solutions of a system of linear inequalities are all the ordered pairs that satisfy all the linear inequalities in the system.

**Tell whether the ordered pair is a solution of the given system.**

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

$$\begin{aligned} -3 &\leq -3(-1) + 1 & -3 &< 2(-1) + 2 \\ -3 &\leq 3 + 1 & -3 &< -2 + 2 \\ -3 &\leq 4 & -3 &< 0 \end{aligned}$$

yes.

2.  $(-1, 5); \begin{cases} y < -2x - 1 \\ y \geq x + 3 \end{cases}$

$$\begin{aligned} 5 &< -2(-1) - 1 \\ 5 &< 2 - 1 \\ 5 &< 1 \end{aligned}$$

No

3.  $(0, 1); \begin{cases} y < -3x + 2 \\ y \geq x - 1 \end{cases}$

$$\begin{aligned} 1 &< -3(0) + 2 & 1 &\geq 0 - 1 \\ 1 &< 2 & 1 &\geq -1 \end{aligned}$$

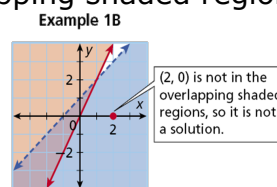
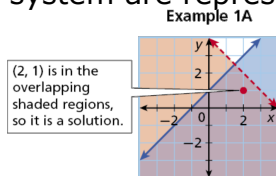
yes.

4.  $(0, 0); \begin{cases} y > -x + 1 \\ y > x - 1 \end{cases}$

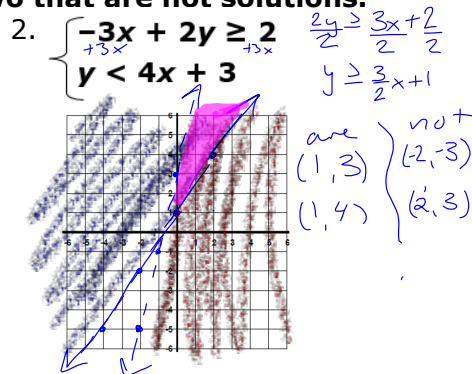
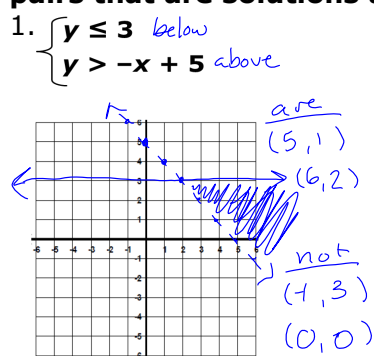
$$\begin{aligned} 0 &> -0 + 1 \\ 0 &> 1 \end{aligned}$$

No

To show all the solutions of a system of linear inequalities, graph the solutions of each inequality. The solutions of the system are represented by the overlapping shaded regions.

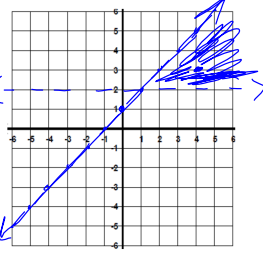


**Graph the system of linear inequalities. Give two ordered pairs that are solutions and two that are not solutions.**

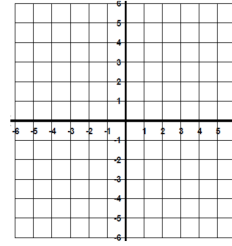


3. 
$$\begin{cases} y \leq x + 1 \\ y > 2 \end{cases}$$

are  $(4,3)$   $(5,5)$  } not  $(4,1)$   $(2,5)$  ←



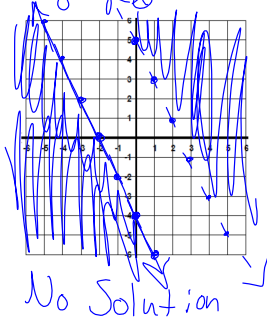
4. 
$$\begin{cases} y > x - 7 \\ 3x + 6y \leq 12 \end{cases}$$



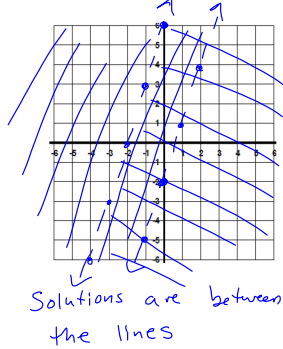
Complete or your own.

**Graph the system of linear inequalities. Describe the solutions.**

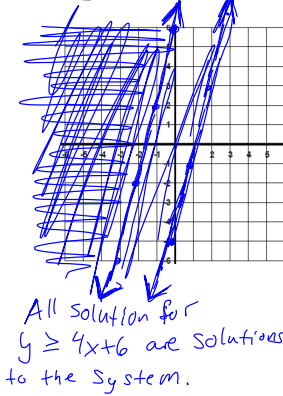
1. 
$$\begin{cases} y \leq -2x - 4 \\ y > -2x + 5 \end{cases}$$



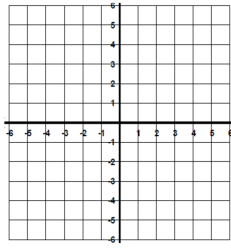
2. 
$$\begin{cases} y < 3x + 6 \\ y > 3x - 2 \end{cases}$$



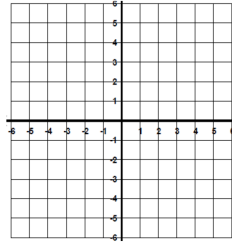
3. 
$$\begin{cases} y \geq 4x + 6 \\ y \geq 4x - 5 \end{cases}$$



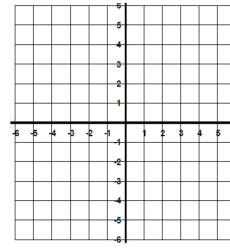
4.  $\begin{cases} y > x + 1 \\ y \leq x - 3 \end{cases}$



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



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



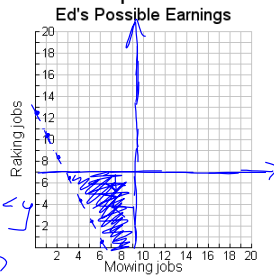
Complete on your own

In one week, Ed can mow at most 9 times and rake at most 7 times. He charges \$20 for mowing and \$10 for raking. He needs to make more than \$125 in one week. Show and describe all the possible combinations of mowing and raking that Ed can do to meet his goal. List two possible combinations.

Earnings per Job (\$)	
Mowing	20
Raking	10

$9 \geq x$  smaller  
 $7 \geq y$  smaller

$125 < 20x + 10y$   
 $-20x \quad -20x$   
 $(8, 4)$   
 $(7, 5)$   
 $\frac{-20x + 125}{10} < \frac{10y}{10}$   
 $-2x + 12.5 < y$  away from (0,0)



At her party, Alice is serving pepper jack cheese and cheddar cheese. She wants to have at least 2 pounds of each. Alice wants to spend at most \$20 on cheese. Show and describe all possible combinations of the two cheeses Alice could buy. List two possible combinations.

Price per Pound (\$)	
Pepper Jack	4
Cheddar	2

Complete on your own

