

6.1

Review: Graphing a Linear Equation

A **linear equation** means the equation of a straight line, and can be written in one of two forms.

Standard Form: $ax + by = c$

Slope Intercept Form: $y = mx + b$ with $m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$, for points (x, y) and (x_2, y_2)

$b = y\text{-intercept}$

We can graph these linear equations by plotting a few points and then drawing a line through the points. Always plot at least 3 points when graphing a linear equation to assure the graph is a straight line.

Easy Method 1 (by standard form)

Step 1: To find y -intercept, set $x = 0$.

To find x -intercept, set $y = 0$.

Step 2: Then pick any value for x , and solve for y to get a third point.

Step 3: Plot 3 points from steps 1 and 2, and draw a straight line through them.

Note: The y -intercept is where the graph crosses the y -axis. It could be anywhere on the y -axis. Anywhere on the y -axis is where $x = 0$.

Example 1

Graph $3x + 2y = 6$

► **Solution:** Three points picked

x	y
0	3
2	0
-2	6

Solve for three missing values

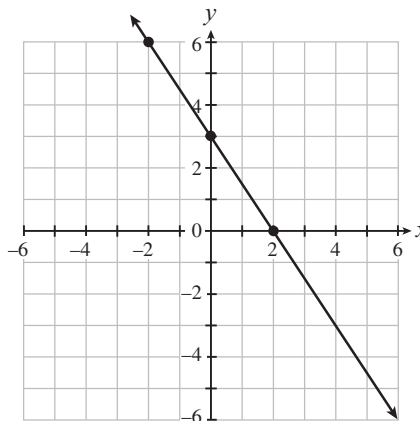
$3x + 2y = 6$	$3x + 2y = 6$	$3x + 2y = 6$
$3(0) + 2y = 6$	$3x + 2(0) = 6$	$3(-2) + 2y = 6$
$y = 3$	$x = 2$	$2y = 12$
		$y = 6$

Therefore, ordered pairs are:

x	y
0	3
2	0
-2	6

Plot these 3 points $(0, 3)$, $(2, 0)$, and $(-2, 6)$ and draw a straight line through the points.

Note: The “arrows” on the line indicate it continues indefinitely in both directions.



Easy Method 2 (by slope intercept form)

Step 1: Transform equation into form $y = mx + b$.

Step 2: Plot the y -intercept or any known point.

Step 3: Travel up if slope is positive or down if slope is negative, by the distance given by the rise. Then travel right a distance given by the run. Plot a point at the new point. Draw a line connecting the three points. Repeat (up/down, then right) for the new point.

or

Step 2: Let x = three values that are divisible by the “run” or denominator of slope.

Step 3: Solve for y .

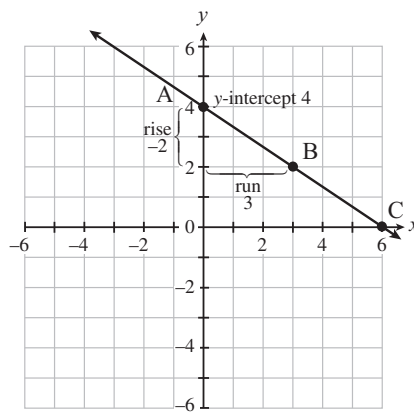
Step 4: Plot three points from step 2 and draw a line through them.

Example 2

Graph $2x + 3y = 12$

► **Solution:** Transform into $y = -\frac{2}{3}x + 4$

Plot the y -intercept of 4 (A), go down 2, and right 3 units. Label new point B (3, 2). From B, go down 2 and right 3 units; new point C is (6, 0). Then draw a straight line through the 3 points, ABC.



or

► **Solution:** Pick three points divisible by 3

Solve for missing y values

x	y
0	
3	
-3	

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

$$y = -\frac{2}{3}(0) + 4$$

$$y = 4$$

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

$$y = -\frac{2}{3}(3) + 4$$

$$y = 2$$

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

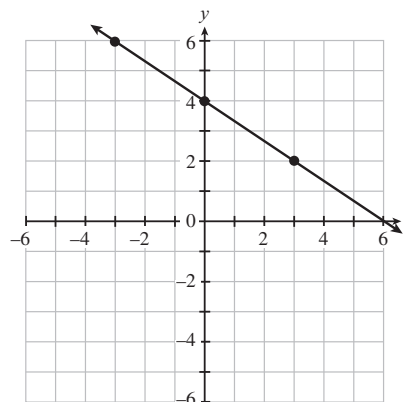
$$y = -\frac{2}{3}(-3) + 4$$

$$y = 6$$

Therefore, ordered pairs are:

x	y
0	4
3	2
-3	6

Plot these 3 points (0, 4), (3, 2), and (-3, 6) and draw a straight line through the points.



Summary

To Graph a Linear Equation

- Step 1: Find at least three ordered pairs that are solutions to the linear equations. The third point provides a check point; if a ruler does not pass through all three points, a mistake has been made.
- Step 2: Plot the points that correspond to these ordered pairs on a coordinate system.
- Step 3: Draw a straight line through these points.

Solve Linear System Algebraically

Two or more equations considered together are called a system of equations. The ordered pair or pairs that is/are common to all linear equations in a system is called a solution of the system.

Example 1 Is $(2, -2)$ a solution to $2x - y = 6$ and $-x + 3y = -8$?

▶ Solution:	Check	$2x - y = 6$	$-x + 3y = -8$
		$2(2) - (-2) = 6$	$-2 + 3(-2) = -8$
		$6 = 6$ true	$-8 = -8$ true

Because $(2, -2)$ is a solution to both equations, it is a solution to the system.

Example 2 Is $(-1, 3)$ a solution to $2x + y = 1$ and $x - 3y = -9$?

▶ Solution:	Check	$2x + y = 1$	$x - 3y = -9$
		$2(-1) + 3 = 1$	$-1 - 3(3) = -9$
		$1 = 1$ true	$-10 = -9$ false

Because $(-1, 3)$ is a solution to only one equation and not both, it is not a solution to the system.

Easy Addition Method (Elimination Method)

- Step 1: Write equation of the system in general form $ax + by = c$.
- Step 2: Multiply the terms of one or both of the equations by a constant such that the coefficients of x or y are different only in their sign.
- Step 3: Add the equations and solve the resulting equation.
- Step 4: Substitute the value obtained in step 3 into either of the original equations, and solve for the remaining variable.
- Step 5: Steps 3 and 4 gives the solution to the system.
- Step 6: Take values from steps 3 and 4, and substitute into the equation not used in step 4 to check if the solution works in both equations.

Example 1

$$\begin{aligned} \text{Solve: } 2x - 3y &= 2 \\ x + 2y &= 8 \end{aligned}$$

► **Solution:** To eliminate x , multiply the second equation by -2 . Add the results to obtain an equation that has only one variable y .

$$\begin{array}{r} 2x - 3y = 2 \\ -2(x + 2y = 8) \quad \rightarrow \quad \underline{-2x - 4y = -16} \\ \hline -7y = -14 \\ y = 2 \end{array}$$

Substitute the y value into either original equation and solve for x .

$$\begin{aligned} x + 2y &= 8 \\ x + 2(2) &= 8 \\ x &= 4 \end{aligned}$$

Check solution (4, 2) in the other equation.

$$\begin{aligned} 2x - 3y &= 2 \\ 2(4) - 3(2) &= 2 \\ 2 &= 2 \end{aligned}$$

Therefore, solution $(x, y) = (4, 2)$.

Example 2

$$\begin{aligned} \text{Solve: } 4x + 3y &= 5 \\ 3x - 2y &= 8 \end{aligned}$$

► **Solution:** To eliminate y , multiply equation one by 2, and equation two by 3, then add the results.

$$\begin{array}{r} 2(4x + 3y = 5) \rightarrow 8x + 6y = 10 \\ 3(3x - 2y = 8) \rightarrow \underline{9x - 6y = 24} \\ \hline 17x = 34 \\ x = 2 \end{array}$$

Substitute the value of x into either original equation.

$$\begin{aligned} 4x + 3y &= 5 \\ 4(2) + 3y &= 5 \\ 3y &= -3 \\ y &= -1 \end{aligned}$$

Check solution (2, -1) in the other equation.

$$\begin{aligned} 3x - 2y &= 8 \\ 3(2) - 2(-1) &= 8 \\ 8 &= 8 \end{aligned}$$

Therefore, solution $(x, y) = (2, -1)$

Example 3

$$\begin{aligned} \text{Solve: } 3x - 2y &= 1 \\ -6x + 4y &= 3 \end{aligned}$$

► **Solution:** To eliminate x , multiply equation one by 2, then add the results.

$$\begin{array}{r} 2(3x - 2y = 1) \quad \rightarrow \quad 6x - 4y = 2 \\ -6x + 4y = 3 \quad \rightarrow \quad \underline{-6x + 4y = 3} \\ \hline 0 = 5 \end{array} \quad \text{Not true for any value of } (x, y)$$

Therefore, there is no solution, the lines must be parallel.

Use $y = 2$ to find the value of x .

$$\begin{aligned}x &= 3y - 5 \\ &= 3(2) - 5 \\ &= 6 - 5 \\ &= 1\end{aligned}$$

Check solution $(1, 2)$ in the other equation.

$$\begin{aligned}4x - y &= 2 \\ 4(1) - 2 &= 2 \\ 2 &= 2\end{aligned}$$

Therefore, solution $(x, y) = (1, 2)$

Note: the same solution is arrived at if you start by solving for y in equation one, $y = 4x - 2$, then substitute this value of y into equation two.

Problem Solving

Many students think this is a difficult topic, but with some helpful tips students are capable of being very successful solving these types of problems.

Steps to follow in Problem Solving

- Step 1: Read the problem very carefully to determine what you are asked to solve.
 Step 2: Let x and y be the unknown variables. (*Note:* other letters can be used for the variables, eg., l = length, w = width.)
 Step 3: If possible, draw a diagram, or make a table, to help organize the data.
 Step 4: Express all equations in terms of x and y (or other appropriate letters).
 Step 5: Use an appropriate method such as the addition or substitution method to solve for the unknown.
 Step 6: Check answer to make sure all conditions are satisfied in your problem.

Example 1

Adult tickets for the school play are \$12.00 and children's tickets are \$8.00. If a theatre holds 300 seats and the sold out performance brings in \$3280.00, how many children and adults attended the play?

► *Solution:* Let x = adult tickets and y = child tickets. Then one equation must deal with the **number** of tickets and the other equation must deal with **revenue** of the tickets.

So $x + y = 300$ (number of tickets)

$12x + 8y = 3280$ (revenue of tickets)

	Adult Tickets	Children Tickets	Total
No. of Tickets	x	y	300
Revenue \$	$12x$	$8y$	3280

Use Substitution Method

$$x + y = 300 \quad 12x + 8y = 3280$$

So $y = 300 - x$ Substitute for y : $12x + 8(300 - x) = 3280 \rightarrow 12x + 2400 - 8x = 3280$

$$4x = 880$$

$$x = 220$$

$$x + y = 300 \quad \text{check: } (220, 80) \quad 12x + 8y = 3280$$

$$220 + y = 300 \quad 12(220) + 8(80) = 3280 \quad \text{True}$$

$$y = 80$$

Therefore, 220 adult tickets and 80 children's tickets were sold.

Example 2

A small airplane makes a 2400 km trip in $7\frac{1}{2}$ hours, and makes the return trip in 6 hours. If the plane travels at a constant speed, and the wind blows at a constant rate, find the airplane’s airspeed and the speed of the wind.

► **Solution:** Let x = speed of airplane with no wind
 Let y = speed of the wind

	Speed (km/h)	Time (hr)	Distance (km)
With Wind	$x + y$	6	2400
Against Wind	$x - y$	$7\frac{1}{2}$	2400

Then $x + y$ is speed of plane going with the wind
 $x - y$ is speed of plane going against the wind

$$\begin{array}{rcl}
 d = s \times t & & \\
 2400 = (x + y) \times 6 & x + y = 400 & x + y = 400 \\
 2400 = (x - y) \times 7\frac{1}{2} & \underline{x - y = 320} & 360 + y = 400 \\
 & 2x = 720 & y = 40 \\
 & x = 360 &
 \end{array}$$

Therefore, speed of airplane is 360 km/h, and wind speed is 40 km/h.

Example 3

A chemist has two acid solutions in stock: one that is a 50% solution and the other an 80% solution. How much of each solution should be mixed to obtain 100 millilitres of a 68% solution?

► **Solution:** Let x = number of millilitres of 50% solution used
 Let y = number of millilitres of 80% solution used

	50% Solution	80% Solution	Total
Acid (mL)	x	y	100
Strength	$0.50x$	$0.80y$	0.68×100

$$\begin{array}{l}
 x + y = 100 \\
 0.50x + 0.80y = 0.68(100)
 \end{array}$$

By substitution:

$$\begin{array}{rcl}
 y = 100 - x & & x + y = 100 \\
 0.50x + 0.80(100 - x) = 68 & & 40 + y = 100 \\
 0.50x + 80 - 0.80x = 68 & & y = 60 \\
 x = 40 & &
 \end{array}$$

Therefore, we need 40 millilitres of the 50% solution, and 60 millilitres of the 80% solution.

6.1 Exercise Set

1. Determine whether the given ordered pair is a solution to the following equation:

a) $(2, 3); 3x - 5y = -9$ _____

b) $(0, 4); y = -\frac{1}{3}x + 4$ _____

c) $(1, -1); 3y = 5 - 2x$ _____

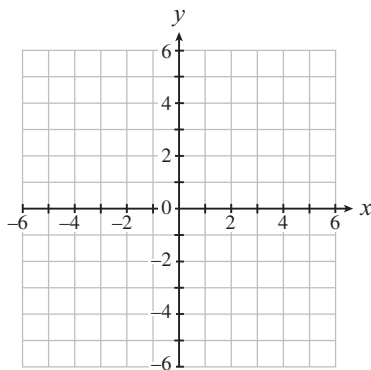
d) $(6, 8); \frac{1}{3}x - \frac{1}{4}y = 4$ _____

e) $(4, 2); x = 4$ _____

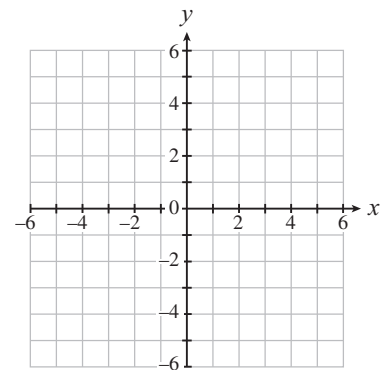
f) $(-1, 3); y = -1$ _____

2. Graph the following equations.

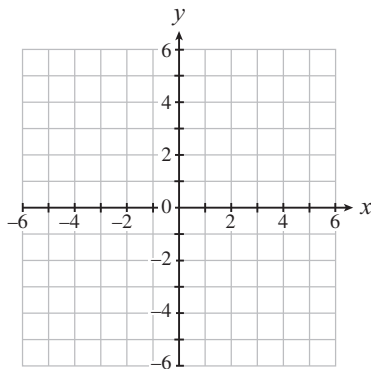
a) $2x + 3y = 6$



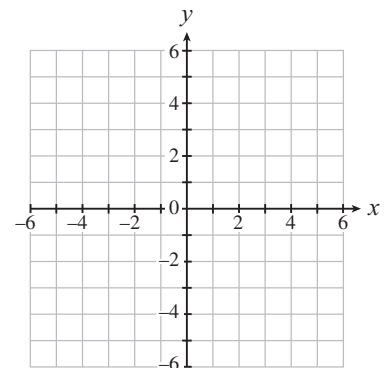
b) $2x + y = -4$



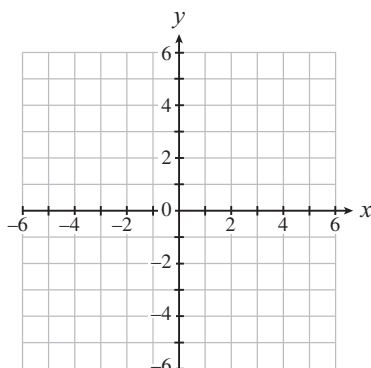
c) $2x - \frac{1}{2}y = 2$



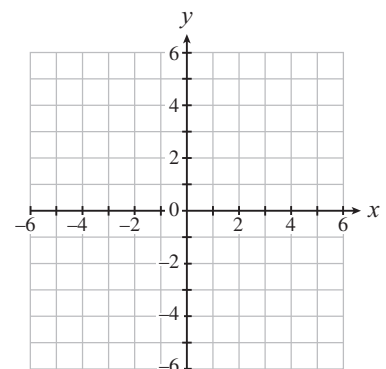
d) $3x + 2y = 5$



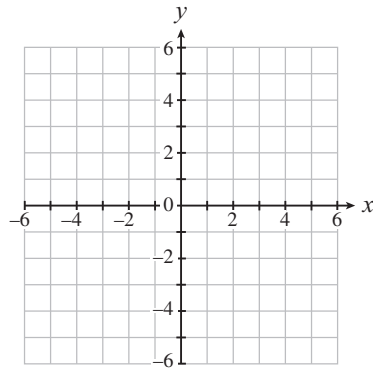
e) $\frac{2}{3}x - 0.4y = 2$



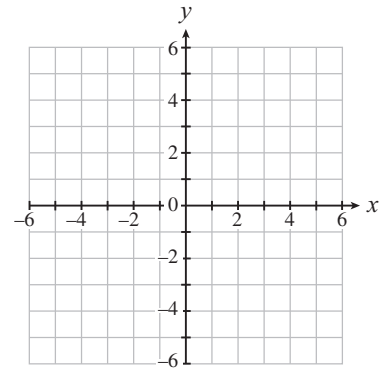
f) $y = -2x - 1$



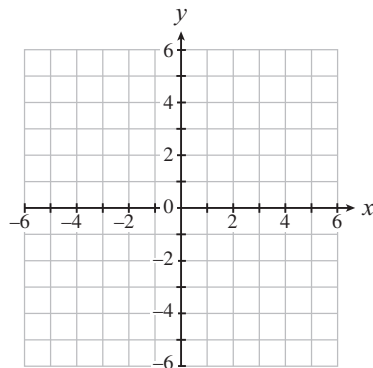
2. g) $y = -\frac{3}{4}x + 1$



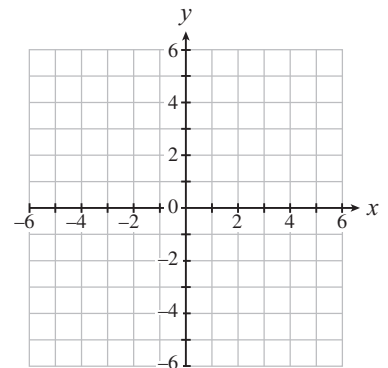
h) $y = \frac{2}{3}x - 2$



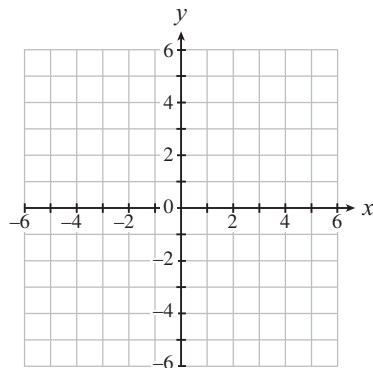
i) $x = 2(y - 1) + 1$



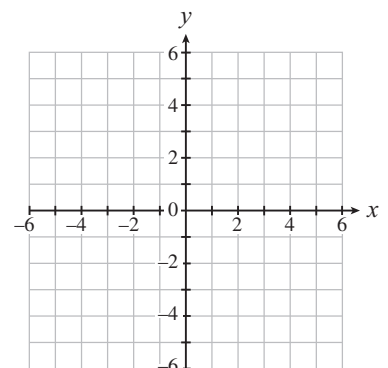
j) $2(x - y) + 6 = 0$



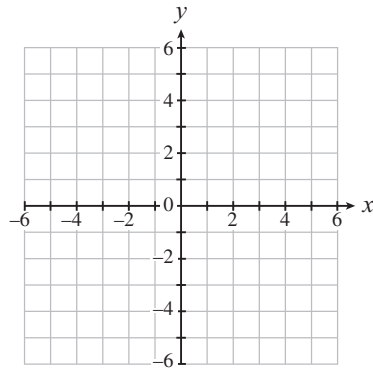
k) $x = \frac{2}{3}y - 1$



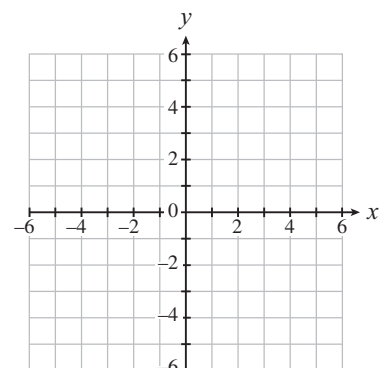
l) $\frac{x}{2} - \frac{y}{3} = 1$



m) $x = 3$



n) $y = -2$



Solve Linear Systems Algebraically

3. The Addition Method

a) $3x + 5y = 17$

$4x - y = -8$

b) $4x + 3y = 1$

$3x + 2y = 2$

c) $7x - 3y = -5$

$3x + 5y = -21$

d) $5x + 2y = 8$

$3x + 5y = 20$

e) $5x - 3y = \frac{21}{2}$

$2x + 5y = -2$

f) $3x - 2y = 6$

$-6x + 4y = -6$

g) $3x - 2y = 6$

$-6x + 4y = -12$

h) $\frac{x}{3} + \frac{y}{4} = 1$

$\frac{x}{2} - \frac{y}{8} = \frac{7}{2}$

3. i) $\frac{3}{x} + \frac{4}{y} = \frac{5}{2}$
 $\frac{-5}{x} + \frac{3}{y} = -\frac{7}{4}$

j) $\frac{6}{x} - \frac{19}{y} = 3$
 $\frac{5}{x} - \frac{6}{y} = 2$

k) $0.1x + 0.01y = 0.73$
 $0.2x + 0.05y = 1.55$

l) $0.02x + \frac{y}{2} = 0.4$
 $\frac{x}{2} - 0.4y = -2.9$

4. The substitution method.

a) $y = 3x + 4$
 $2x - 3y = 2$

b) $y = -2x$
 $x + 4y = 21$

c) $6x - y = 0$
 $8x - 3y = 25$

d) $2s + t = -3$
 $3s + 2t = -4$

4. e) $y = \frac{1}{3}x + 2$
 $2x - 6y = -12$

f) $2x = 3y + 4$
 $6x = 9y + 8$

g) $-3a + 2b = 4$
 $5a - 3b = 1$

h) $\frac{x}{3} - \frac{y}{4} = \frac{1}{12}$
 $\frac{x}{6} - \frac{3y}{2} = -\frac{7}{8}$

i) $\frac{1}{3}x - y = 3$
 $2x + \frac{1}{2}y = 5$

j) $\frac{x}{2} - \frac{2y}{3} = 2$
 $\frac{x}{4} + 3y = -4$

k) $\frac{3}{x} + \frac{4}{y} = \frac{5}{2}$
 $-\frac{5}{x} + \frac{3}{y} = -\frac{7}{4}$

l) $-\frac{4}{x} + \frac{9}{y} = 1$
 $\frac{7}{x} - \frac{6}{y} = \frac{3}{2}$

5. Problem Solving with Two and Three Variables.

- a) Attila has \$50 000 to invest. He invests some in the stock market which earns 8%, and some in bonds that earns 6% on his investment. If the total interest earned was \$3500, how much did Attila invest in stock and how much in bonds?
- b) Jerry has 80 coins, consisting of dimes and quarters. If the total value of his coins is \$15.20, how many dimes does he have?
- c) Tricia has one brand of coffee that sells for \$7.50 per kg, and another brand that sells for \$9.00 per kg. How many kilograms of each brand must she use to make a blend of 50 kilograms at \$7.98 per kg?
- d) A barrel of wine has 8% alcohol, another barrel has 15% alcohol. How much of each must be mixed to have 100 litres of 12.2% alcohol wine?
- e) Renting a mobile home for 4 days and driving 800 km costs \$864.00. If the trip was 7 days and you drove 1200 km, the cost would be \$1392.00. What is the cost per day, and the cost per kilometre for renting the mobile home?
- f) Mary works part time selling both hats and scarves. One week she earns \$114.00 by selling 8 hats and 10 scarves. The following week she sold 12 hats and 6 scarves, and earned \$108.00. How much does she earn for each hat and each scarf she sells?

5. g) A plane travels 2835 km in 7 hours with a tailwind, but only 1827 km with a headwind in the same time. Find the speed of the plane, and the speed of the wind.
- h) A boat took 4 hours to make a downstream trip with a 6 km/h current. The return trip against the current took 5 hours. What distance did the boat travel in one direction?
- i) Tickets for a school lottery are \$2.00 each or 3 for \$5.00. The school sold 300 tickets and the total amount of money taken in was \$528.00. How many people bought only a single ticket?
- j) A car travels 480 kilometres in the same time that a truck travels 400 kilometres. The speed of the car is 16 kilometres per hour faster than the truck. Determine the car and truck speeds.
- k) How many litres each of 5% antifreeze and 20% antifreeze must be combined to get 10 litres of solution that is 12.5% antifreeze?
- l) Merilee bought 2 kg of coffee and 3 kg of tea, paying \$39. She later needed 1 kg of coffee and 2 kg of tea, costing \$24. How much did she pay for each kg of coffee and tea?

6.2

Linear Inequalities

The solution for a linear inequality is a section of the coordinate plane called a half-plane. The boundary is found by replacing the inequality sign with an equal sign and graphing the linear equation. If the inequality equation has the symbol \geq or \leq , the boundary line is included in the solution, and is represented by a solid line. If the inequality equation has the symbol $>$ or $<$, the boundary line is not included in the solution, and is represented by a dashed line.

Graphing a Linear Inequality

Easy Method of Graphing a Linear Inequality

Step 1: Graph the linear equality equation. Use a solid line if the original inequality equation includes $=$ (\geq or \leq), or a dashed line if the original equation does not include $=$ ($>$ or $<$).

Step 2: This step may be completed in 2 ways as follows:

Method 1 (inequality in the form $ax + by \leq c$ or $ax + by > c$)

Choose a test point **not** on the line and substitute the point into the inequality equation. If the inequality is true, shade the half-plane containing the test point. If not true, shade the other half-plane (not containing the test point).

Method 2 (inequality equation in slope intercept form, $y < mx + b$ or $y \geq mx + b$)

Look at the inequality equation; if y is greater than, or greater than or equal, graph upper half-plane, if y is less than, or less than or equal, graph lower half-plane.

Example 1

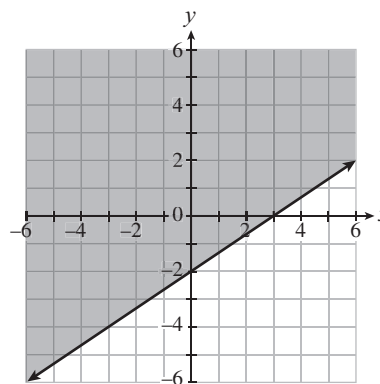
$$2x - 3y \leq 6 \quad \text{or} \quad y \geq \frac{2}{3}x - 2$$

► **Solution:** Step 1: Graph the linear equation $2x - 3y = 6$.
Since the inequality \leq includes $=$,
use a solid line.

Step 2: **Method 1**
test point $(0, 0)$
 $2x - 3y \leq 6$
 $2(0) - 3(0) \leq 6$
 $0 \leq 6$ true statement
Therefore, shade region that has $(0, 0)$.

Method 2

Equation $y \geq \frac{2}{3}x - 2$ is \geq
Therefore, graph upper half-plane.



Solve Systems of Linear Inequalities

Steps to follow are the same as graphing a single linear inequality, except that the solution must be the intersection of all inequality equations. This is the region where all points satisfy all the inequalities at the same time.

Example 1

Solve: $2x - y > 3$

$x + y \geq 3$

$2x - y = 3$	
x	y
0	-3
1.5	0
3	3

$x + y = 3$	
x	y
0	3
3	0
-2	5

> has a dashed line

 \geq has a solid line► **Solution:**Test Point (0, 0)
from region A

$2x - y > 3$ no

$x + y \geq 3$ no

Test Point (5, 1)
from region C

$2x - y > 3$ yes

$x + y \geq 3$ yes

Test Point (2, 4)
from region B

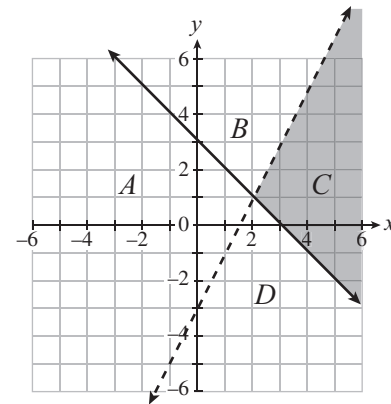
$2x - y > 3$ no

$x + y \geq 3$ yes

Test Point (2, -3)
from region D

$2x - y > 3$ yes

$x + y \geq 3$ no



The only region with a test point that satisfies both inequalities is region C.

Example 2

Solve: $3x + 2y \leq 6$

$x - 2y > 4$

$3x + 2y = 6$	
x	y
0	3
2	0
4	-3

$x - 2y = 4$	
x	y
0	-2
4	0
-4	-4

> has a solid line

 \geq has a dashed line► **Solution:**Test Point (0, 0)
from region A

$3x + 2y \leq 6$ yes

$x - 2y > 4$ no

Test Point (5, -1)
from region C

$3x + 2y \leq 6$ no

$x - 2y > 4$ yes

Test Point (2, 4)
from region B

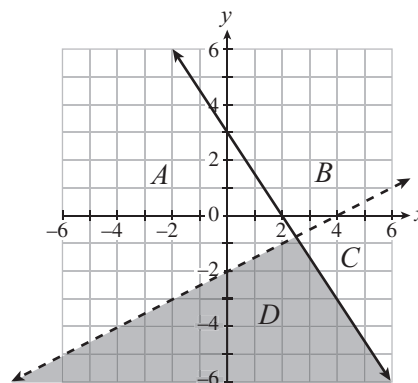
$3x + 2y \leq 6$ no

$x - 2y > 4$ no

Test Point (2, -3)
from region D

$3x + 2y \leq 6$ yes

$x - 2y > 4$ yes



Solution is the shading of region D.

Example 3

Graph the system of linear inequalities:

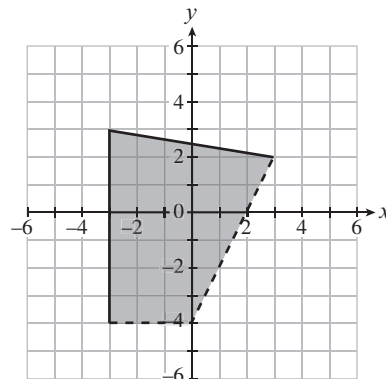
$$x \geq -3$$

$$y > -4$$

$$y > 2x - 4$$

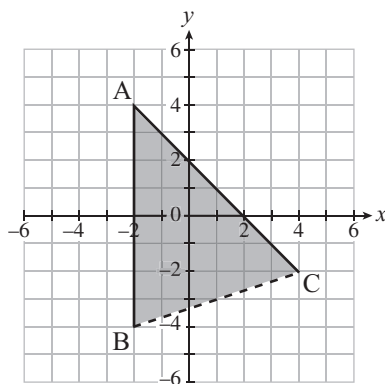
$$x + 6y \leq 15$$

► **Solution:** For $x \geq 3$ graph solid line $x = 3$, then shade to right.
 $y > -4$ graph dashed line $y = -4$ then shade up.
 $y > 2x - 4$ graph dashed line $y = 2x - 4$, then shade up
 $x + 6y \leq 15$ graph solid line $y \leq -\frac{1}{6}x + \frac{5}{2}$, then shade down.



Example 4

Write a system of linear inequalities that has the given graph:



► **Solution:** Points of intersect are A (-2, 4), B (-2, -4) and C (4, -2)
 Equation of vertical line is $x \geq -2$

Equation of dashed line BC has slope $m = \frac{-2 - (-4)}{4 - (-2)} = \frac{2}{6} = \frac{1}{3}$ $y = mx + b$

using C (4, -2), $-2 = \frac{1}{3}(4) + b$

$$b = -\frac{10}{3}$$

$$y > \frac{1}{3}x - \frac{10}{3}$$

Equation of solid line AC has slope $m = \frac{4 - (-2)}{-2 - 4} = -1$ y -intercept is 2

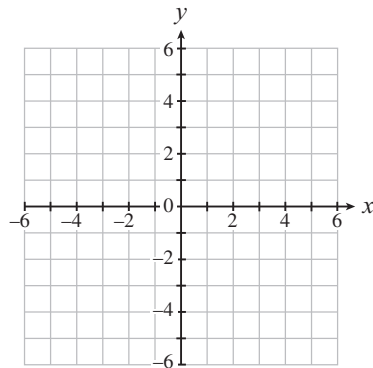
$$y \leq -x + 2$$

Thus, the system is $x \geq -2$, $y > \frac{1}{3}x - \frac{10}{3}$, and $y \leq -x + 2$

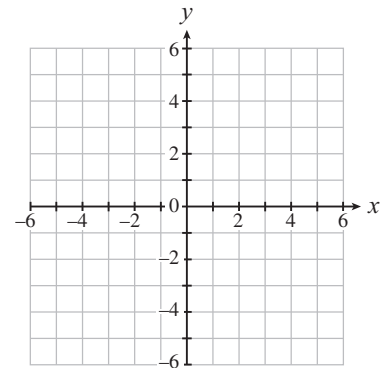
6.2 Exercise Set

1. Graph the following inequalities on the grid provided.

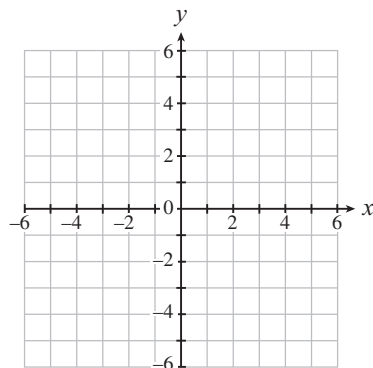
a) $3x + y \geq 6$



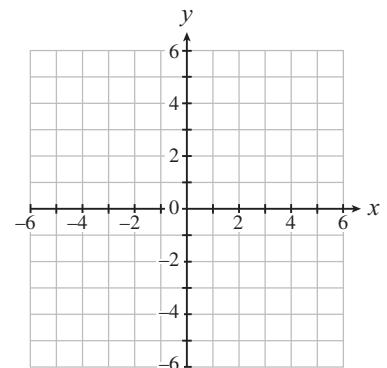
b) $2x - y < 4$



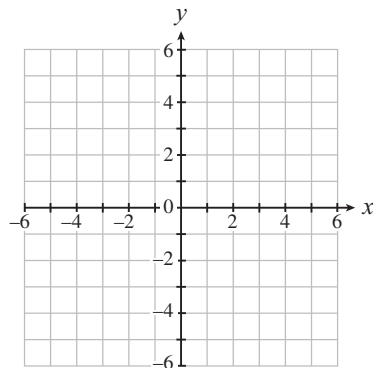
c) $0.4x - \frac{2}{3}y > 2$



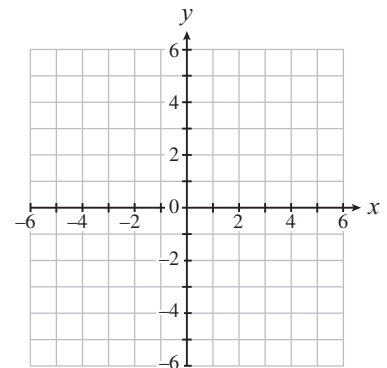
d) $\frac{1}{3}x + \frac{2}{3}y \geq 2$



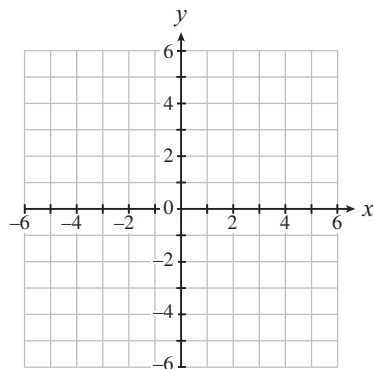
e) $y \geq \frac{1}{2}x + 3$



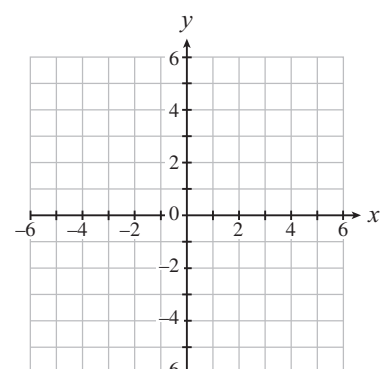
f) $y < -\frac{4}{3}x + 2$



g) $x < 2$

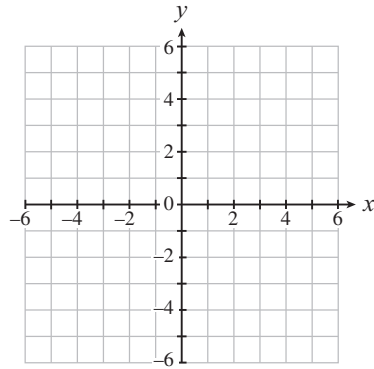


h) $y > -3$

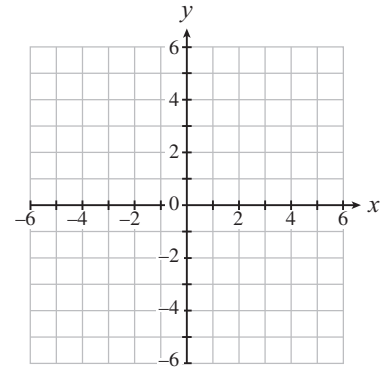


2. Graph the systems of linear inequalities; shade in the solution.

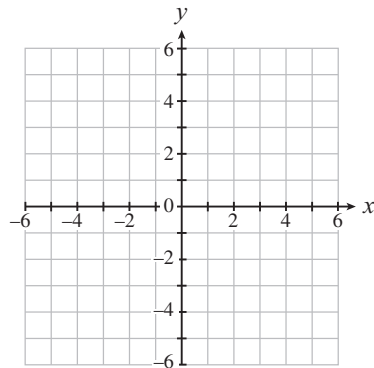
a) $y \geq x$
 $2y < -x + 2$



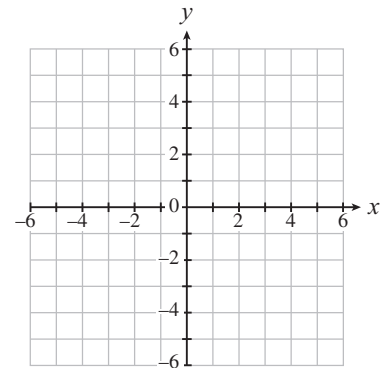
b) $x + 2y > 4$
 $3x - 2y \leq 6$



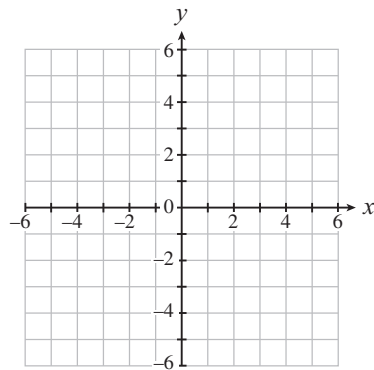
c) $x + y \leq 2$
 $x + y \geq -2$



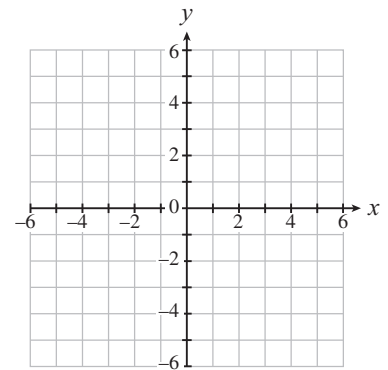
d) $y \leq x + 1$
 $y \geq -x + 1$



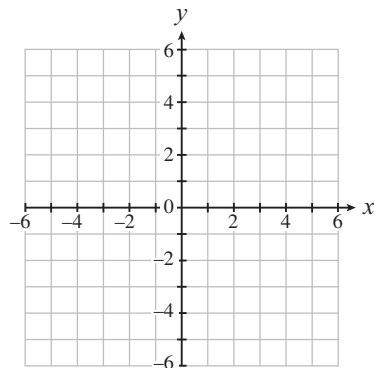
e) $4x + 5y < 20$
 $2x - y \leq 4$
 $x \geq 0$
 $y \geq 0$



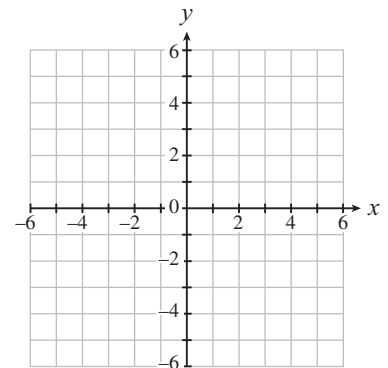
f) $x - y \leq 1$
 $x - y \geq -3$
 $-1 \leq x \leq 3$



g) $x - y \leq 2$
 $x + 2y \leq 4$
 $x \leq -1$

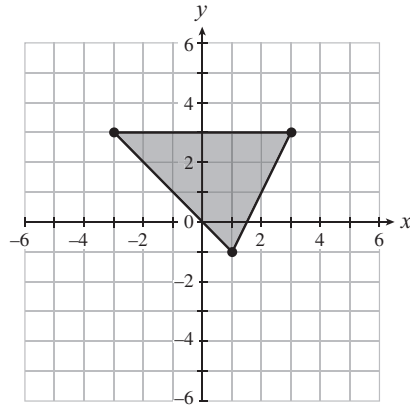


h) $x + y \leq 4$
 $2x - y \geq 2$
 $x \geq 0$
 $y \leq 0$

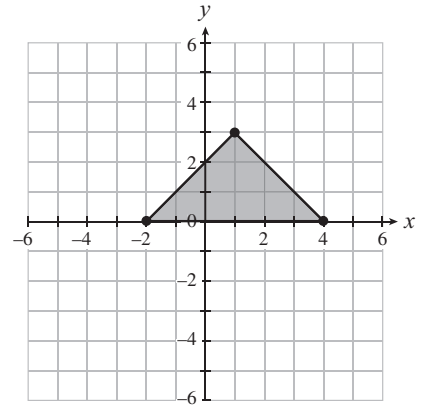


3. Write a system of linear inequalities that forms the given graph.

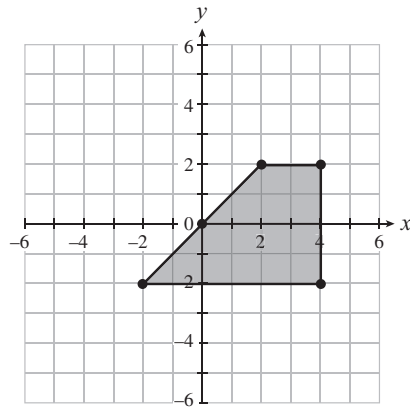
a)



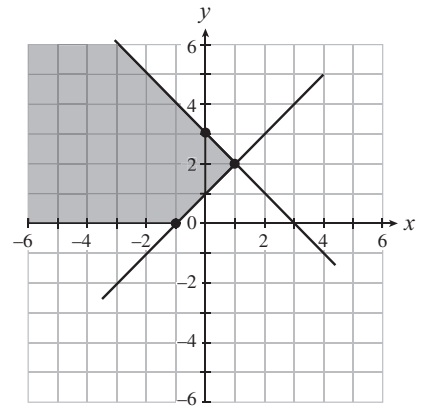
b)



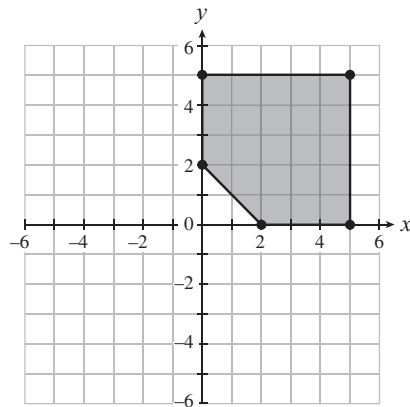
c)



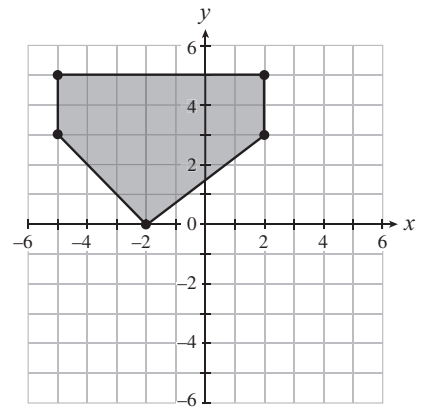
d)



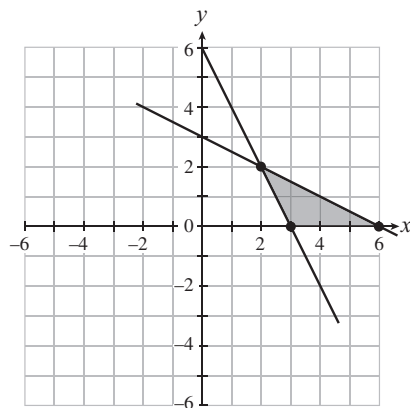
e)



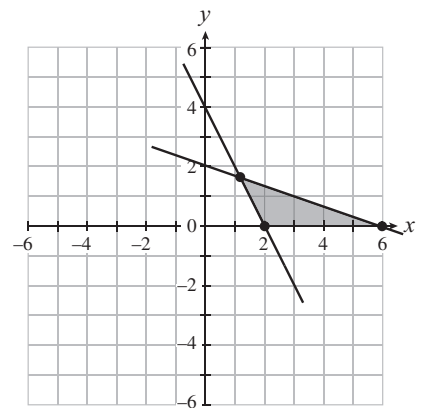
f)



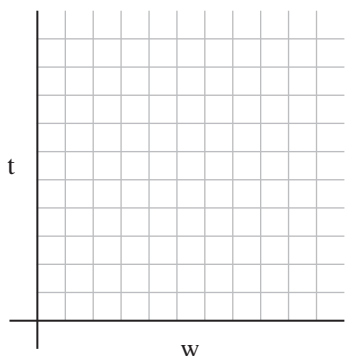
g)



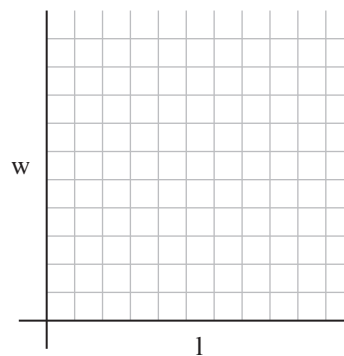
h)



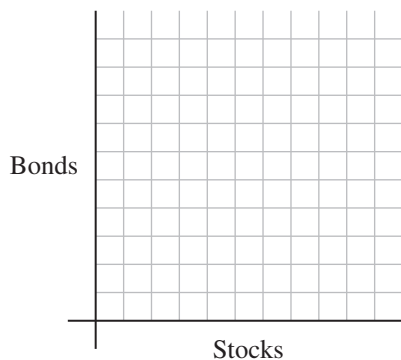
4. The Winnipeg Moose need at least 90 points to make the playoffs. A win is worth 2 points and a tie 1 point. Graph the system, and label the corner points.



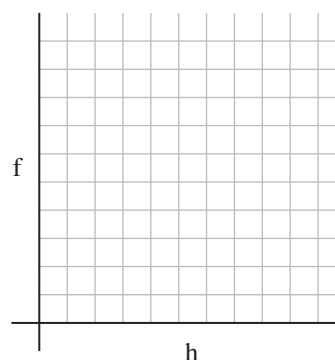
5. The size of a hockey rink must be between 190 and 200 ft in length, and between 80 and 85 ft in width. Graph the system, and label the corner points.



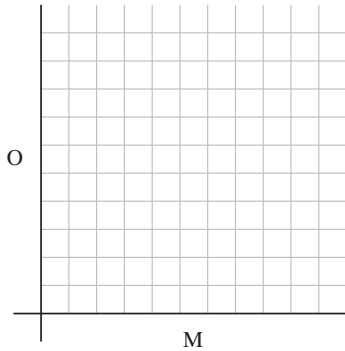
6. A person has up to \$50 000 to invest. His financial advisor recommends that at least \$35 000 be invested in stocks and at most \$10 000 in bonds. Graph the system, and label the corner points.



7. A skate manufacturer can produce as many as 60 pairs of hockey skates, and 45 pairs of figure skates, per day. It takes 3 hours of labour to produce a pair of hockey skates, and 4 hours of labour to produce a pair of figure skates. The company has up to 240 hours available for production each day. Graph the system, and label the corner points.



8. A test is made up of multiple-choice and open-ended questions. It takes up to 3 minutes to do a multiple-choice question, and up to 6 minutes for an open-ended question. Total time is 60 minutes, and you may answer no more than 18 questions. Graph the system, and label the corner points.



9. A store sells two brands of TVs. Brand A sells at least twice as much as brand B. The store must carry at least 10 of brand B, and has room for no more than 90 TVs. Graph the system, and label the corner points.

