Chapter 2
Systems of Linear Equations and Inequalities Table of Contents

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2.6 Solving Systems of Linear Inequalities
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

a. Write equations for the cost to print \( n \) flyers using these two printing options.
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

a. Write equations for the cost to print \( n \) flyers using these two printing options.

Answer: Let \( n \) = Number of flyers printed.
\[ T(n) = \text{Cost in dollars to print flyers using the traditional printing method.} \]
\[ D(n) = \text{Cost in dollars to print flyers using digital printing.} \]
\[ T(n) = 250 + 0.15n \]
\[ D(n) = 50 + 0.20n \]
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

b. Graph the two equations on the same calculator window.
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

b. Graph the two equations on the same calculator window.

Answer:
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

c. Find the number of flyers that will result in the same cost for both printing methods.
Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

c. Find the number of flyers that will result in the same cost for both printing methods.

Answer: Printing 4000 flyers will cost $850 using either printing method.
Solve the following system by graphing the equations by hand

\[ y = \frac{1}{4}x - 2 \]
\[ y = -\frac{1}{3}x + 5 \]
Solve the following system by graphing the equations by hand

\[ y = \frac{1}{4}x - 2 \]
\[ y = -\frac{1}{3}x + 5 \]

Answer: The solution to the system is the point (12,1).

<table>
<thead>
<tr>
<th>Year</th>
<th>Geothermal</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>5.37</td>
<td>1.79</td>
</tr>
<tr>
<td>2004</td>
<td>5.43</td>
<td>2.24</td>
</tr>
<tr>
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</tr>
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<td>5.12</td>
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a. Find a model for the percent of renewable energy produced by using geothermal energy.

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<td>4.69</td>
</tr>
</tbody>
</table>

a. Find a model for the percent of renewable energy produced by using geothermal energy.

Answer:
Let $t = \text{years since 2000}$
$G(t) = \text{Percent of renewable energy produced using geothermal energy.}$
(using the last two points)

$G(t) = -0.08t + 5.68$

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b. Find a model for the percent of renewable energy produced by using wind.

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<td>4.69</td>
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b. Find a model for the percent of renewable energy produced by using wind.

Answer:
Let $W(t) =$ percent of renewable energy produced using wind.

$$W(t) = 0.82t - 1.03$$

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\[
G(t) = -0.08t + 5.68
\]

\[
W(t) = 0.82t - 1.03
\]

c. Estimate the year in which the percentages of geothermal and wind energy are the same.

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\[
G(t) = -0.08t + 5.68
\]
\[
W(t) = 0.82t - 1.03
\]

c. Estimate the year in which the percentages of geothermal and wind energy are the same.

Answer: About (7.48,5.1) In about 2008 the percentage of renewable energy produced using geothermal will be the same as that produced using wind.
Use the table on the calculator to numerically find the solution to the system.

\[ y = 4x + 10 \]
\[ y = 3x + 15 \]
Use the table on the calculator to numerically find the solution to the system

\[ y = 4x + 10 \]
\[ y = 3x + 15 \]

Answer: The solution to the system is the point (5,30).

<table>
<thead>
<tr>
<th>X</th>
<th>Y₁</th>
<th>Y₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

a. \( y = 6x + 4 \)
\( y = 6x - 2 \)
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

a. \[ y = 6x + 4 \]
\[ y = 6x - 2 \]

Answer: The slopes of both lines are \( m = 6 \), but the equations do not have the same \( y \)-intercept. Therefore these lines are parallel and this is an inconsistent system with no solutions.
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

b. \[ y = \frac{2}{5}x - 10 \]
   \[ y = 0.2x + 1 \]
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

b. \[ y = \frac{2}{5} x - 10 \]
\[ y = 0.2x + 1 \]

Answer: The slopes are not the same so the system is consistent with independent lines. Using a table we find that the solution to the system is (55, 12).
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

c. \[ y = \frac{1}{2} x + 6 \]
\[ 2x - 4y = -24 \]
For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

c. \[ y = \frac{1}{2} x + 6 \]
\[ 2x - 4y = -24 \]

Answer: These two equations are the same line. The system is a consistent system with dependent lines. Any solution of the equation \[ y = \frac{1}{2} x + 6 \] is a solution to the system.
Solve the system using the substitution method.

\[ y = 4x - 5 \]
\[ y = x + 22 \]
Solve the system using the substitution method.

\[ y = 4x - 5 \]
\[ y = x + 22 \]

Answer: \((9, 31)\)
Using the models from Section 2.1 for geothermal and wind energy, find the year when the amount of geothermal and wind energy produced will be the same.

\[ G(t) = -0.08t + 5.68 \]
\[ W(t) = 0.82t - 1.03 \]

Where \( G(t) \) is the percentage of renewable energy produced using geothermal energy \( t \) years since 2000 and \( W(t) \) is the percentage of renewable energy produced using wind energy \( t \) years since 2000.
Using the models from Section 2.1 for geothermal and wind energy, find the year when the amount of geothermal and wind energy produced will be the same.

\[ G(t) = -0.08t + 5.68 \]
\[ W(t) = 0.82t - 1.03 \]

Where \( G(t) \) is the percentage of renewable energy produced using geothermal energy \( t \) years since 2000 and \( W(t) \) is the percentage of renewable energy produced using wind energy \( t \) years since 2000.

Answer: (7.46, 5.08) In about 2008 the percentage of renewable energy produced using geothermal will be the same as that produced using wind.
Solve the following systems using the substitution method.

a. \( h = 3c - 11 \)
\[ h - 5c = -16 \]
Solve the following systems using the substitution method.

a. \[ h = 3c - 11 \]
   \[ h - 5c = -16 \]

Answer: \((2.5, -3.5)\)
Solve the following systems using the substitution method.

b. \[2w = 3b + 12\]
\[5w + 4b = -39\]
Solve the following systems using the substitution method.

b. \[2w = 3b + 12\]
\[5w + 4b = -39\]

Answer: \((-6, -3)\)
As a new sales employee you are given two salary structures to choose from. The first option has a base salary of $1200 per month and 7% commission on sales made. The second option has a base salary of $800 per month and 9% commission on sales made.

a. Find equations to represent the two salary options.
As a new sales employee you are given two salary structures to choose from. The first option has a base salary of $1200 per month and 7% commission on sales made. The second option has a base salary of $800 per month and 9% commission on sales made.

a. Find equations to represent the two salary options.

Answer: Let

\[ F(s) = \text{the monthly salary in dollars earned using the first option.} \]
\[ S(s) = \text{the monthly salary in dollars earned using the second option.} \]
\[ s = \text{the total sales in dollars made during the month.} \]

\[ F(s) = 1200 + 0.07s \]
\[ S(s) = 800 + 0.09s \]
\[ F(s) = 1200 + 0.07s \]
\[ S(s) = 800 + 0.09s \]

b. Find what sales amount will result in the same monthly salary for both options.
\[ F(s) = 1200 + 0.07s \]
\[ S(s) = 800 + 0.09s \]

b. Find what sales amount will result in the same monthly salary for both options.

Answer: Sales of $20,000 in a month will result in both options earning $2600 a month.
When Raja retired she received a $760,000 lump sum retirement package. She wants to invest this amount in two accounts. The first account pays 4% simple interest and the second account pays 7% simple interest. Raja wants to earn $47,500 per year in interest to live on.

a. Write a system of equations that will help Raja find the amount she should invest in each account.
When Raja retired she received a $760,000 lump sum retirement package. She wants to invest this amount in two accounts. The first account pays 4% simple interest and the second account pays 7% simple interest. Raja wants to earn $47,500 per year in interest to live on.

a. Write a system of equations that will help Raja find the amount she should invest in each account.

Answer: Let

\[ A = \text{Amount invested in dollars in the account paying 4\% simple interest.} \]
\[ B = \text{Amount invested in dollars in the account paying 7\% simple interest.} \]

\[ A + B = 760,000 \]
\[ 0.04A + 0.07B = 47,500 \]
\[ A + B = 76,000 \]
\[ 0.04A + 0.07B = 47,500 \]

b. How much should Raja invest in each account to earn the $47,500 she wants each year?
b. How much should Raja invest in each account to earn the $47,500 she wants each year?

Answer: Raja should invest $190,000 in the account paying 4% simple interest and $570,000 in the account paying 7% simple interest.
Solve the following systems. Label each system as consistent or inconsistent. If the system is consistent, determine if the lines are independent or dependent.

a.  
\[ d = 2.3a + 4.7 \]
\[ 5d - 11.5a = 23.5 \]
Solve the following systems. Label each system as consistent or inconsistent. If the system is consistent, determine if the lines are independent or dependent.

a.

\[ d = 2.3a + 4.7 \]

\[ 5d - 11.5a = 23.5 \]

Answer: These equations represent the same lines so the system is consistent with dependent lines. Any solution to the equation \( d = 2.3a + 4.7 \) is a solution to the system.
Solve the following systems. Label each system as consistent or inconsistent. If the system is consistent, determine if the lines are independent or dependent.

b. 

\[ m = 5p + 10 \]

\[ 2m = 10p - 20 \]
Solve the following systems. Label each system as consistent or inconsistent. If the system is consistent, determine if the lines are independent or dependent.

b. 

\[
m = 5p + 10
\]

\[
2m = 10p - 20
\]

Answer: These equations have the same slope but different y-intercepts so they represent parallel lines. Therefore this is an inconsistent system with no solutions.
Solve the system using the elimination method.

\[7x + 3y = 6\]
\[4x - 6y = 42\]
Solve the system using the elimination method.

\[ 7x + 3y = 6 \]
\[ 4x - 6y = 42 \]

Answer: \((3, -5)\)
Yomaira needs 70 ml of 45% saline solution for a science experiment. She has some 60% saline solution and some 20% saline solution. How much of each of these solutions should Yomaira combine to get the 70 ml of 45% saline solution she needs?
Yomaira needs 70 ml of 45% saline solution for a science experiment. She has some 60% saline solution and some 20% saline solution. How much of each of these solutions should Yomaira combine to get the 70 ml of 45% saline solution she needs?

**Answer:** Let

- $A =$ Amount of 60% saline solution in milliliters.
- $B =$ Amount of 20% saline solution in milliliters.

\[ A + B = 70 \]
\[ 0.60A + 0.20B = 70(0.45) \]

Yomaira should use 43.75 ml of the 60% saline solution and 26.25 ml of the 20% saline solution.
Solve the system of equations using the elimination method.

\[ 4a + 9b = 2 \]
\[ 12a + 6b = 48 \]
Solve the system of equations using the elimination method.

\[
\begin{align*}
4a + 9b &= 2 \\
12a + 6b &= 48
\end{align*}
\]

Answer: \((5, -2)\)
Solve the following systems of equations using the elimination method.

a. 
\[ 5x - 7y = -4 \]
\[ -3x + 9y = 6 \]
Solve the following systems of equations using the elimination method.

a. \[
5x - 7y = -4 \\
-3x + 9y = 6
\]

Answer: \( \left( \frac{1}{4}, \frac{3}{4} \right) \)
Solve the following systems of equations using the elimination method.

\[ 2m - 6n = -4 \]
\[ -7m + 21n = 14 \]
Solve the following systems of equations using the elimination method.

b. \[ 2m - 6n = -4 \]
\[ -7m + 21n = 14 \]

Answer: This is a consistent system with dependent lines. Any solution to the equation \( 2m - 6n = -4 \) is also a solution to the system.
Solve the following inequalities.

a. \(-6b + 10 > 40\)

b. \(8g - 12 \leq 3g + 2\)
Solve the following inequalities.

a. \(-6b + 10 > 40\)
   
   Answer: \(b < -5\)

b. \(8g - 12 \leq 3g + 2\)
   
   Answer: \(g \leq \frac{14}{5}\)
Using the printing flyers classroom example from section 2.1 we get the following

\[ n = \text{Number of flyers printed.} \]
\[ T(n) = \text{Cost in dollars to print flyers using the traditional printing method.} \]
\[ D(n) = \text{Cost in dollars to print flyers using digital printing.} \]

\[ T(n) = 250 + 0.15n \quad D(n) = 50 + 0.20n \]

Find for what numbers of flyers the traditional printing method would be cheaper than the digital prints.
Using the printing flyers classroom example from section 2.1 we get the following

\[ n = \text{Number of flyers printed.} \]
\[ T(n) = \text{Cost in dollars to print flyers using the traditional printing method.} \]
\[ D(n) = \text{Cost in dollars to print flyers using digital printing.} \]

\[ T(n) = 250 + 0.15n \quad D(n) = 50 + 0.20n \]

Find for what numbers of flyers the traditional printing method would be cheaper than the digital prints.

Answer: \[ 250 + 0.15n < 50 + 0.20n \]
\[ n > 4000 \]

If printing more than 4000 flyers the traditional printing method is cheaper than the digital printing.

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<thead>
<tr>
<th>Year</th>
<th>Percent of Women</th>
<th>Percent of Men</th>
</tr>
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<tbody>
<tr>
<td>1991</td>
<td>25.4</td>
<td>24.9</td>
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a. Find equations for models of these data.
The percentage of United States population with high blood cholesterol is given in the table.  

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</table>

a. Find equations for models of these data.

**Answer:**  
Let $t =$ Years since 1990

$W(t) =$ Percent of women in the US with high blood cholesterol.

$M(t) =$ Percent of men in the US with high blood cholesterol.

\[
W(t) = 0.33t + 25.1 \\
M(t) = 0.74t + 23.4
\]
The percentage of United States population with high blood cholesterol is given in the table. 

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\[ W(t) = 0.33t + 25.1 \quad M(t) = 0.74t + 23.4 \]

b. Use the models to approximate when the percent of men with high blood cholesterol is higher than the percent of women.

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\[ W(t) = 0.33t + 25.1 \quad M(t) = 0.74t + 23.4 \]

b. Use the models to approximate when the percent of men with high blood cholesterol is higher than the percent of women.

Answer: \( t > 4.15 \) After 1994 the percentage of men who have high blood cholesterol is higher than the percentage of women with high blood cholesterol. This is a little early according to the data but it is the estimate the models give.
Solve the inequality numerically using the calculator table.

$4x + 12 < 5x + 4$
Solve the inequality numerically using the calculator table.

\[4x + 12 < 5x + 4\]

Answer:

\[
\begin{array}{|c|c|c|}
\hline
X & Y_1 & Y_2 \\
\hline
1 & 16 & 9 \quad Y_1 > Y_2 \\
3 & 24 & 19 \quad Y_1 > Y_2 \\
5 & 32 & 29 \quad Y_1 > Y_2 \\
6 & 36 & 34 \quad Y_1 > Y_2 \\
8 & 44 & 44 \quad Y_1 = Y_2 \\
9 & 48 & 49 \quad Y_1 < Y_2 \\
11 & 56 & 59 \quad Y_1 < Y_2 \\
\hline
\end{array}
\]

\(X = 11\)

\(x > 8\)
Solve the inequality graphically.

\[-x + 3 \leq 4x + 13\]
Solve the inequality graphically.

\[-x + 3 \leq 4x + 13\]

Answer:

\[x \geq -2\]
Solve the following equations.

a. \( |x + 7| = 4 \)

b. \( 2|x - 5| + 6 = 20 \)
Solve the following equations.

a. \[ |x + 7| = 4 \]

Answer: \[ x = -3 \text{ or } x = -11 \]

b. \[ 2|x - 5| + 6 = 20 \]

Answer: \[ x = -2 \text{ or } x = 12 \]
Solve the following equations.
c. \(|m - 4| + 12 = 8|
Solve the following equations.

c. \[ |m - 4| + 12 = 8 \]

Answer: No real solution.
Estella is driving from Savannah, Georgia to Washington, D.C. Along the way she will pass through Richmond, Virginia. Estella’s distance from Richmond can be modeled by the function

\[ D(t) = |460 - 60t| \]

where \( D(t) \) is Estella’s distance in miles from Richmond after driving for \( t \) hours. Find the time when Estella will be 40 miles from Richmond.
Estella is driving from Savannah, Georgia to Washington, D.C. Along the way she will pass through Richmond, Virginia. Estella’s distance from Richmond can be modeled by the function

\[ D(t) = |460 - 60t| \]

where \( D(t) \) is Estella’s distance in miles from Richmond after driving for \( t \) hours. Find the time when Estella will be 40 miles from Richmond.

Answer: Estella will be 40 miles from Richmond after driving for 7 hours and again after 8.3 hours.
Write the given interval using a compound inequality.

a. 

b. 
Write the given interval using a compound inequality.

a. 

Answer: $-8 \leq x \leq 8$

b. 

Answer: $-6 < x < 10$
Solve the following inequalities. Give the solution as an inequality and graph the solution set on a number line.

a. $|x - 4| < 6$

b. $|x + 3| + 8 \leq 10$
Solve the following inequalities. Give the solution as an inequality and graph the solution set on a number line.

a. \(|x - 4| < 6\)

Answer: \(-2 < x < 10\)

b. \(|x + 3| + 8 \leq 10\)

Answer: \(-5 \leq x \leq -1\)
A person with mild high blood pressure will have a systolic pressure (first number) that satisfies the inequality

$$|S - 150| \leq 10$$

where $S$ is a person’s systolic pressure in millimeters of mercury (mmHg).

Find the range of systolic pressures that people with mild high blood pressure will have.
A person with mild high blood pressure will have a systolic pressure (first number) that satisfies the inequality

\[ |S - 150| \leq 10 \]

where \( S \) is a person’s systolic pressure in millimeters of mercury (mmHg).

Find the range of systolic pressures that people with mild high blood pressure will have.

Answer: \( 140 \leq S \leq 160 \) People with mild high blood pressure will have a systolic pressure between or equal to 140mmHg and 160mmHg.
Write the given interval using a compound inequality.
Write the given interval using a compound inequality.

Answer: $x < -5$ or $x > 2$
Solve the following inequalities. Give the solution as an inequality. Graph the solution set on a number line.

a. $|x + 3| > 5$

b. $|x - 2| + 4 \geq 9$
Solve the following inequalities. Give the solution as an inequality. Graph the solution set on a number line.

a. $|x + 3| > 5$

Answer: $x < -8 \text{ or } x > 2$

b. $|x - 2| + 4 \geq 9$

Answer: $x \leq -3 \text{ or } x \geq 7$
A person with high or low blood pressure will have a diastolic pressure (second number) that satisfies the inequality

$$|D - 75| > 15$$

where $D$ is a person’s diastolic pressure in millimeters of mercury (mmHg).

Find the diastolic blood pressures that would be considered high or low.
A person with high or low blood pressure will have a diastolic pressure (second number) that satisfies the inequality

$$|D - 75| > 15$$

where $D$ is a person’s diastolic pressure in millimeters of mercury (mmHg).

Find the diastolic blood pressures that would be considered high or low.

Answer: $D < 60$ or $D > 90$

Diastolic pressures below 60mmHg or above 90mmHg are considered low or high pressures.
A yard equipment manufacturer produces lawn mowers and roto-tillers in the same plant. Each mower requires 4 hours to produce while roto-tillers require 7 hours to produce. If the plant operates 70 hours per week, what combinations of mowers and roto-tillers can they produce in a week?
A yard equipment manufacturer produces lawn mowers and roto-tillers in the same plant. Each mower requires 4 hours to produce while roto-tillers require 7 hours to produce. If the plant operates 70 hours per week, what combinations of mowers and roto-tillers can they produce in a week?

Answer: Let $M =$ the number of mowers produced in a week  
$R =$ the number of roto-tillers produced in a week.  
$4M + 7R \leq 70$

Any combination of mowers and tillers within the shaded region can be produced at this plan during a week.
Graph the following inequalities by hand:

a. \( y < \frac{1}{3} x - 2 \)
Graph the following inequalities by hand:

\[ y < \frac{1}{3}x - 2 \]

Answer:
Graph the following inequalities by hand:

b. \( y \leq -\frac{2}{3} x + 4 \)
Graph the following inequalities by hand:

b. \( y \leq -\frac{2}{3}x + 4 \)

Answer:
Graph the following inequalities by hand:

c. \(2x - y < -5\)
Graph the following inequalities by hand:

c. $2x - y < -5$

Answer:
Find the inequality for the given graph.
Find the inequality for the given graph.

Answer: \( y > -\frac{1}{2}x + 3 \)
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. Each mower requires 4 hours to produce while roto-tillers require 7 hours to produce. \[ 4M + 7R \leq 70 \]
The same plant must stay in production at least 40 hours per week.

a. Create a system of inequalities to model this situation.
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. Each mower requires 4 hours to produce while roto-tillers require 7 hours to produce. \(4M + 7R \leq 70\)

The same plant must stay in production at least 40 hours per week.

a. Create a system of inequalities to model this situation.

Answer: Let \(M = \) the number of mowers produced in a week

\(R = \) the number of roto-tillers produced in a week.

\[
\begin{align*}
4M + 7R & \leq 70 \\
4M + 7R & \geq 40
\end{align*}
\]
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. The same plant must stay in production at least 40 hours per week.

\[ 4M + 7R \leq 70 \]

\[ 4M + 7R \geq 40 \]

b. Graph the solution set for this system.
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. The same plant must stay in production at least 40 hours per week.

b. Graph the solution set for this system.

Answer:

\[ 4M + 7R \leq 70 \]
\[ 4M + 7R \geq 40 \]
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. The same plant must stay in production at least 40 hours per week.

c. Can the plant produce 8 mowers and 4 roto-tillers in a week?

\[
4M + 7R \leq 70 \\
4M + 7R \geq 40
\]
The yard equipment manufacturer we discussed with example 1 had a time constraint that they could not exceed 70 hours of production per week. The same plant must stay in production at least 40 hours per week.

c. Can the plant produce 8 mowers and 4 roto-tillers in a week?

Answer: 8 mowers and 4 roto-tillers would be the point (8,4) on the graph. This point is in the area of the graph were the solution sets of both inequalities overlap. Therefore, this combination of mowers and roto-tillers can be produced in a week.
Kian has $400,000 from a court settlement to invest. Kian plans to invest the money into two accounts, one paying 3% simple interest and the other paying 4% simple interest. Kian would like to earn at least $14,300 per year to support himself while going back to college. How much should he invest in each account to earn at least $14,300 per year?
Answer: Let $A =$ the amount in dollars invested in the account paying 3% simple interest.

$B =$ the amount in dollars invested in the account paying 4% simple interest.

Any combination of investments in the overlapping shaded region will earn at least $14,300 in interest per year.

$A + B \leq 400000$

$0.03A + 0.04B \geq 14300$
Graph each system of inequalities by hand.

a. $3x - 4y > -12$
   
   $y > -2x - 1$
Graph each system of inequalities by hand.

a. \(3x - 4y > -12\)

\(y > -2x - 1\)

Answer:
Graph each system of inequalities by hand.

b. \( y \geq 1.2x + 2 \)
\( y \leq \frac{6}{5}x - 5 \)
Graph each system of inequalities by hand.

b. \[ y \geq 1.2x + 2 \]
\[ y \leq \frac{6}{5} x - 5 \]

Answer:

No Solution
Graph the system of inequalities using a graphing calculator.

\[ y < 3x - 4 \]
\[ y > -2x + 1 \]
Graph the system of inequalities using a graphing calculator.

\[ y < 3x - 4 \]
\[ y > -2x + 1 \]

Answer: