

Graphs of Systems and Their Applications

Graphs of Linear Systems (Slope-Intercept Form:  $y = mx + b$ )

Example 1:

**Taxi Company A**

You are visiting Baltimore MD, and Taxi Company A charges a flat fee of \$3.00 for using the taxi and an additional \$0.75 per mile. Write an equation that you could use to find the cost of a taxi ride in Baltimore, MD.

\_\_\_\_\_ = the # of miles \_\_\_\_\_ = the cost.

Equation:

x	y
0	
8	

**Taxi Company B**

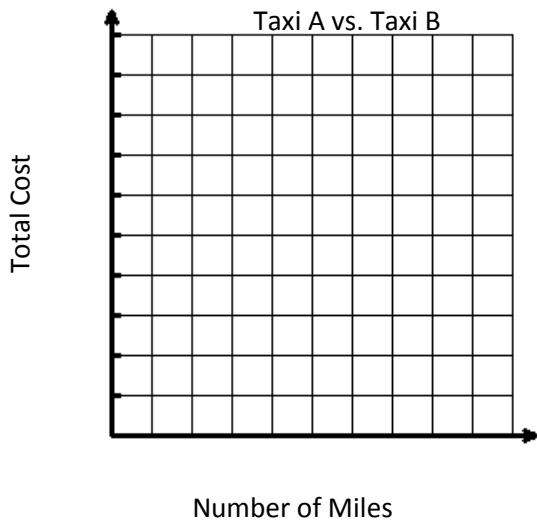
You are visiting Baltimore MD, and Taxi Company B charges a flat fee of \$5 for using the taxi and an additional \$0.50 per mile. Write an equation that you could use to find the cost of a taxi ride in Baltimore, MD.

\_\_\_\_\_ = the # of miles \_\_\_\_\_ = the cost.

Equation:

x	y
0	
10	

Graph both equations on the following grid. Use an interval of 1 on both axes.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if more miles are travelled and what it means if less miles are traveled.)

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Example 2:

**Brady the Plumber**

Brady, a plumber, charges a fee of \$120 to make a house call. He also charges \$10.00 an hour for labor. Write an equation that you could use to find the amount Bob charges for a house call based on the number of hours of labor.

\_\_\_\_\_ = # of hours \_\_\_\_\_ = the cost.

Equation:

x	y
0	
4	

**Valeria the Plumber**

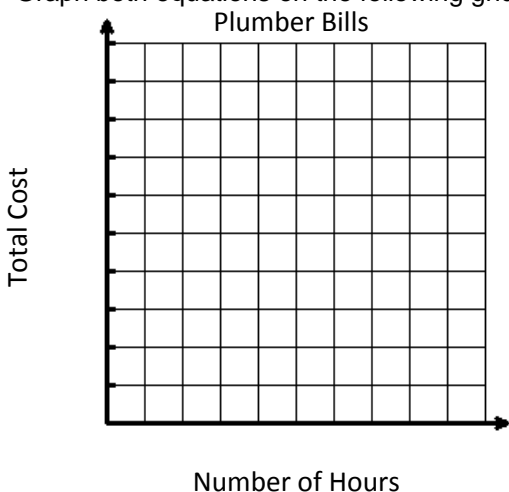
Valeria, a plumber, charges a fee of \$100 to make a house call. She also charges \$15.00 an hour for labor. Write an equation that you could use to find the amount Valeria charges for a house call based on the number of hours of labor.

\_\_\_\_\_ = # of hours \_\_\_\_\_ = the cost.

Equation:

x	y
0	
5	

Graph both equations on the following grid. Use an interval of 1 on the x-axis and 20 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if more hours are needed and what it means if fewer hours are needed.)

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**On your own; #1**

**Hannah's Electricity**

Hannah's electricity company charges her \$0.10 per kWh (kilowatt-hour) of electricity, plus a basic connection charge of \$15.00 per month. Write a linear function that models her monthly electricity bill as a function of electricity usage.

\_\_\_\_\_ = the cost and \_\_\_\_\_ = kWh of electricity.

Equation: \_\_\_\_\_

x	y
0	
200	

**Kemari's Electricity**

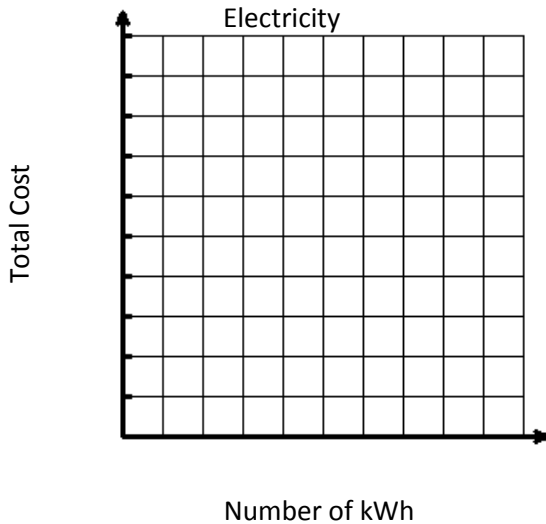
Kemari's electricity company charges her \$0.15 per kWh (kilowatt-hour) of electricity, plus a basic connection charge of \$10.00 per month. Write a linear function that models her monthly electricity bill as a function of electricity usage.

\_\_\_\_\_ = the cost and \_\_\_\_\_ = kWh of electricity.

Equation: \_\_\_\_\_

x	y
0	
200	

Graph both equations on the following grid. Use an interval of 20 on the x-axis and 5 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if more kWh are needed and what it means if fewer kWh are needed.)

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**On your own; #2**

**Joe's Party**

Joe is throwing a party. The clubhouse charges \$500 to rent the space and \$25 per person.

\_\_\_\_\_ = cost and \_\_\_\_\_ = # of people

Equation: \_\_\_\_\_

x	y
0	
20	

**Jack's Party**

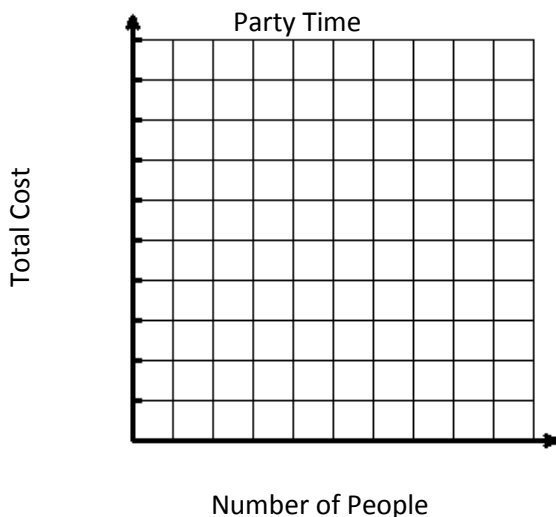
Jack is throwing a party. The clubhouse charges \$600 to rent the space and \$15 per person.

\_\_\_\_\_ = cost and \_\_\_\_\_ = # of people

Equation: \_\_\_\_\_

x	y
0	
20	

Graph both equations on the following grid. Use an interval of 2 on the x-axis and 100 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if more people attend and what it means if fewer people attend.)

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**On your own; #3**

**Savannah's Trip**

Savannah is driving on a trip. She is going an average speed of 70mph. She has already gone 100 miles today.

\_\_\_\_\_ = distance and \_\_\_\_\_ = # hours

Equation:

x	y
0	
10	

**Amy's Trip**

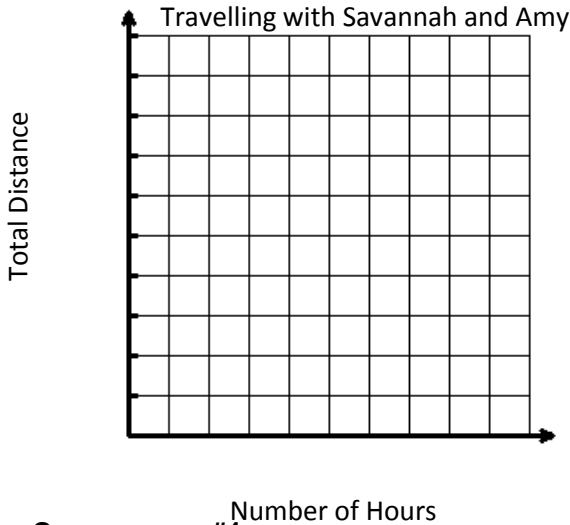
Amy is driving on a trip. She is going an average speed of 50mph. She has already gone 200 miles today.

\_\_\_\_\_ = distance and \_\_\_\_\_ = # hours

Equation:

x	y
0	
10	

Graph both equations on the following grid. Use an interval of 1 on the x-axis and 100 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if more hours are travelled and what it means if fewer hours are travelled.)

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**On your own; #4**

**Jordan's TV**

Jordan is buying a new TV. She can make a down payment of \$100, and then will pay \$60 per month.

\_\_\_\_\_ = \$ paid \_\_\_\_\_ = # of months

Equation:

x	y
0	
10	

**Perla's TV**

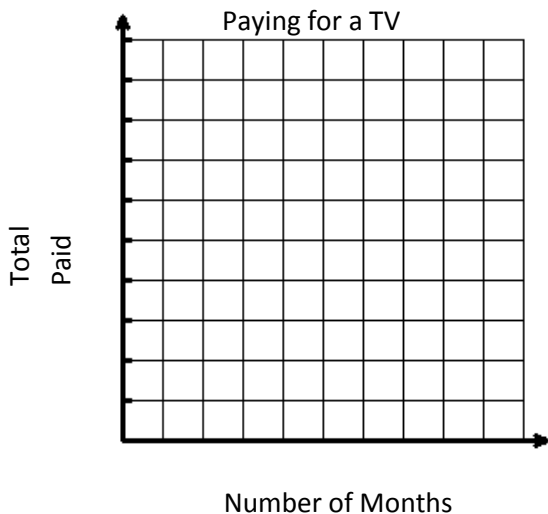
Perla is buying a new TV. She can make a down payment of \$200, and then will pay \$40 per month.

\_\_\_\_\_ = \$ paid \_\_\_\_\_ = # of months

Equation:

x	y
0	
10	

Graph both equations on the following grid. Use an interval of 1 on the x-axis and 100 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation? (Include what each value means, what it means if they pay more months and what it means if they pay fewer months.)

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**On your own; #5**

**Kallie's Work-outs**

Kallie is conditioning for try-outs. She has already run 10 miles. She will run 2 miles per day.

\_\_\_\_\_ = distance and \_\_\_\_\_ = #days

Equation:

x	y
0	
20	

**Blake's Work-outs**

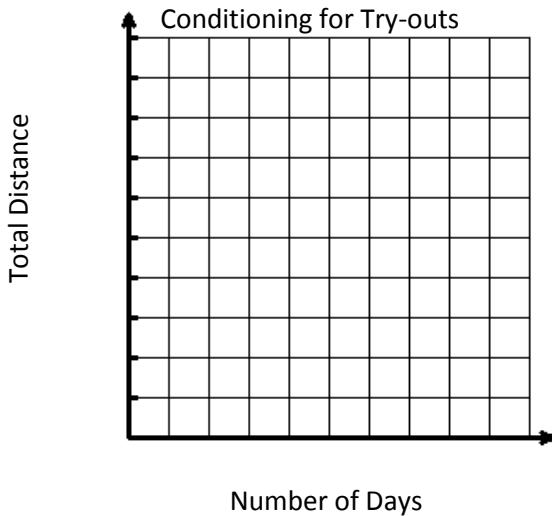
Blake is conditioning for try-outs. He has already run 15 miles. He will run 1.5 miles per day.

\_\_\_\_\_ = distance and \_\_\_\_\_ = #days

Equation:

x	y
0	
20	

Graph both equations on the following grid. Use an interval of 2 on the x-axis and 5 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation?  
(Include what each value means, what it means if they exercise more days and what it means if they exercise fewer days.)

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**On your own; #6**

**Bethany's Cabin**

Bethany is renting a cabin in Tennessee. They charge a \$200 cleaning fee and \$100 per night.

\_\_\_\_\_ = total cost and \_\_\_\_\_ = #nights

Equation:

x	y
0	
8	

**Mandy's Hotel**

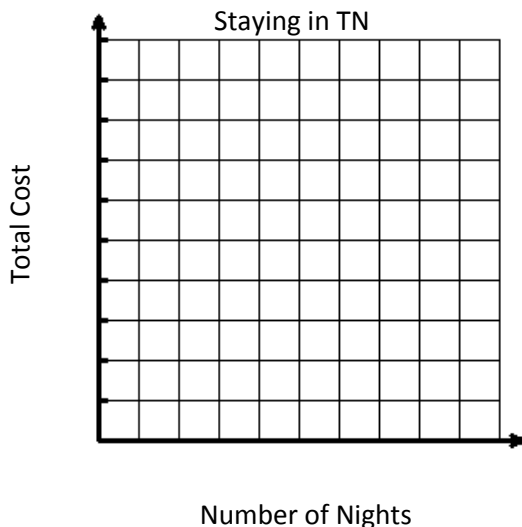
Mandy is renting a hotel room at the Lodge in Tennessee. They don't charge a cleaning fee and \$150 per night.

\_\_\_\_\_ = total cost and \_\_\_\_\_ = #nights

Equation:

x	y
0	
6	

Graph both equations on the following grid. Use an interval of 1 on the x-axis and 100 on the y-axis.



- 1) Name the point of intersection: \_\_\_\_\_
- 2) What does the point of intersection mean to the situation?  
(Include what each value means, what it means if they stay more nights and what it means if they stay fewer nights.)

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Graphs of Linear Systems (Standard Form:  $Ax + By = C$ )

**Example 1:** You are running a concession stand at the basketball game. You sell hotdogs for \$1 and sodas for \$2. You sold a total of 120 items. At the end of the night, you made \$200.

Define your variables: \_\_\_\_\_

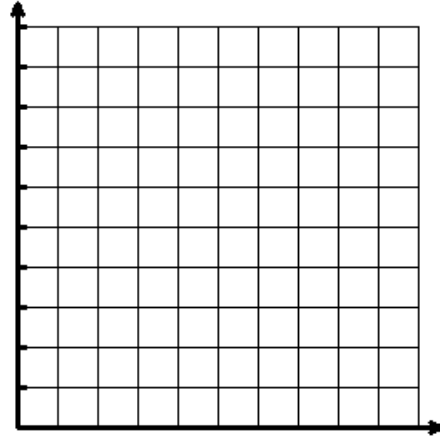
Write a system of equations: \_\_\_\_\_  
 \_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
 (Hotdogs, Sodas) Use an interval of 20 on the x-axis  
 and 20 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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**Example 2:** Beaumont is sponsoring a pancake dinner to raise money for a field trip. Each adult ticket will cost \$20 and each child's ticket will cost \$10. You estimate a total of 70 tickets to be sold. At the end of the night, you made \$900.

Define your variables: \_\_\_\_\_

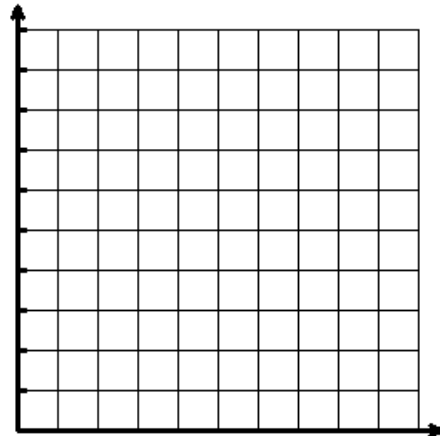
Write a system of equations: \_\_\_\_\_  
 \_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
 (Adults, Children) Use an interval of 10 on the x-axis  
 and 10 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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**Your turn.**

**1) A test has *multiple choice* questions worth 2 points apiece and *short answer* questions worth 4 points apiece. There are a total of 30 questions. The test is worth a total of 100 points.**

Define your variables: \_\_\_\_\_

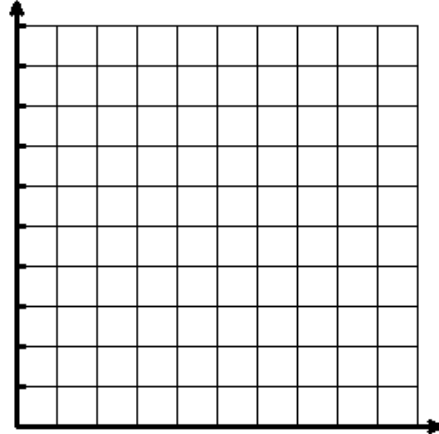
Write a system of equations: \_\_\_\_\_  
\_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(MC Questions, SA Questions) Use an interval of 5 on the x-axis  
and 5 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

\_\_\_\_\_  
\_\_\_\_\_

**2) Justice has saved five dollar bills and singles. Justice has a total of 35 bills. His savings are worth a total of \$75.**

Define your variables: \_\_\_\_\_

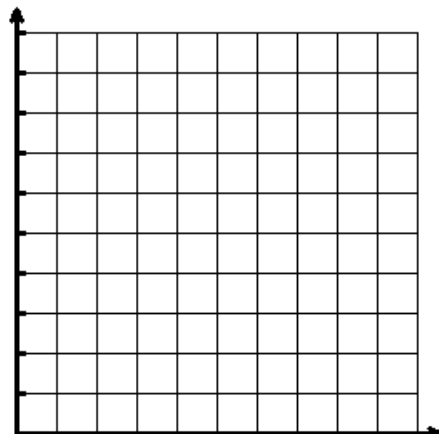
Write a system of equations: \_\_\_\_\_  
\_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(Fives, Singles) Use an interval of 5 on the x-axis  
and 10 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

\_\_\_\_\_  
\_\_\_\_\_

**3) Claire bought sandwiches and drinks at the ballgame. The sandwiches cost \$4 each and the drinks were \$2 each. Claire bought 9 items for a total of \$28.**

Define your variables: \_\_\_\_\_

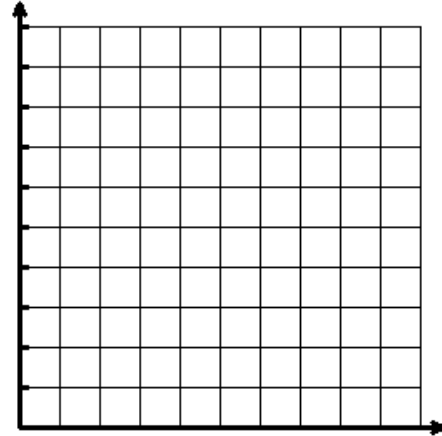
Write a system of equations: \_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(Sandwiches, Drinks) Use an interval of 1 on the x-axis and 2 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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**4) The store at which Michael usually shops is having a sale. Roast beef costs \$4 a pound and shrimp costs \$10 a pound. He bought 16 pounds of meat for a total cost of \$100.**

Define your variables: \_\_\_\_\_

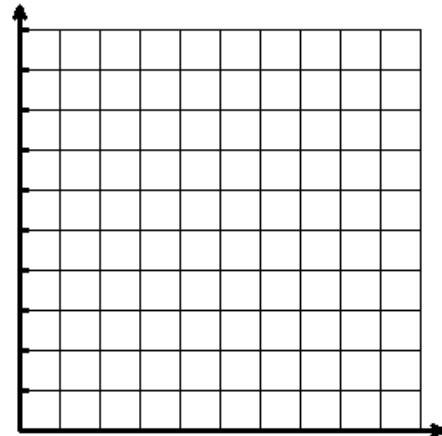
Write a system of equations: \_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(Roastbeef, shrimp) Use an interval of 2.5 on the x-axis and 2 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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**5) It will take 20 points to make the playoffs, the hockey team coach told the players. “We get 2 points for a win and 1 point for a tie.” The team has 12 games left in the season.**

Define your variables: \_\_\_\_\_

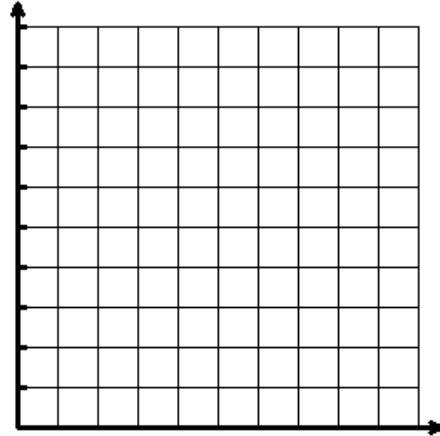
Write a system of equations: \_\_\_\_\_  
\_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(Wins, Ties) Use an interval of 2 on the x-axis  
and 2 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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**6) You are in charge of buying the hamburger and chicken for a party. You have \$60 to spend. The hamburger costs \$2 per pound and chicken is \$3 per pound. You bought 25 pounds of meat.**

Define your variables: \_\_\_\_\_

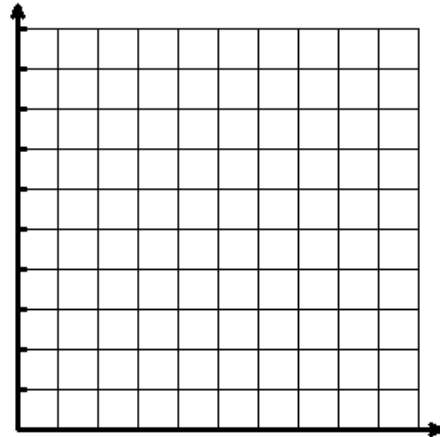
Write a system of equations: \_\_\_\_\_  
\_\_\_\_\_

Find the x-intercept and y intercept for both equations.

Eq. 1: \_\_\_\_\_ and \_\_\_\_\_

Eq 2: \_\_\_\_\_ and \_\_\_\_\_

Graph your system on the same coordinate grid.  
(Hamburger, Chicken) Use an interval of 5 on the x-axis  
and 5 on the y-axis)



State the coordinates of intersection. Explain what these coordinates tell you about the situation.

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