Graduation Celebration !

Project Tasks

You are about to graduate high school and embark on new adventures in your life. You want to create a lasting memory with your friends to celebrate this life achievement with a memorable graduation celebration. As the chairperson for the celebration party, you are in charge of submitting the party plans to the senior class advisor for approval. You will need to determine how many people you should plan for, how you will raise money, where you will hold the party, what foods will be provided, what will be the cost per person, and what entertainment will be provided. If all of your plans are in place, this party will be one that the classes will be talking about for years!

Below is the list of tasks that you must complete in this project. A task is a set of activities that you will work on under the direction of your tutor.

Task 1: Who's In?

Activity 1: Scatter It!

To calculate the cost of your party, you must begin by determining how many people will attend. The following table represents the attendance at the senior party for the past 13 years. To estimate the attendance for this year, 2020, you should use this information to make a prediction (function) based on the relationship between the year and the number of students.

Year	Number of Students in Attendance
2007	215
2008	225
2009	235
2010	210
2011	215
2012	200
2013	190
2014	180
2015	185
2016	170
2017	160
2018	165
2019	160

You are trying to predict how many of your classmates will attend this party. Without having time to do a survey, you decide to use the previous senior party attendance to help you make a prediction for this party's turnout. You want to visually represent the data and make a prediction and decide to create a scatter plot for the information above based on years and attendance. Let the year 2007 correspond to x = 0. You may use the graph paper provided below or you may use an online graphing feature. Share your graph with your Tutor.
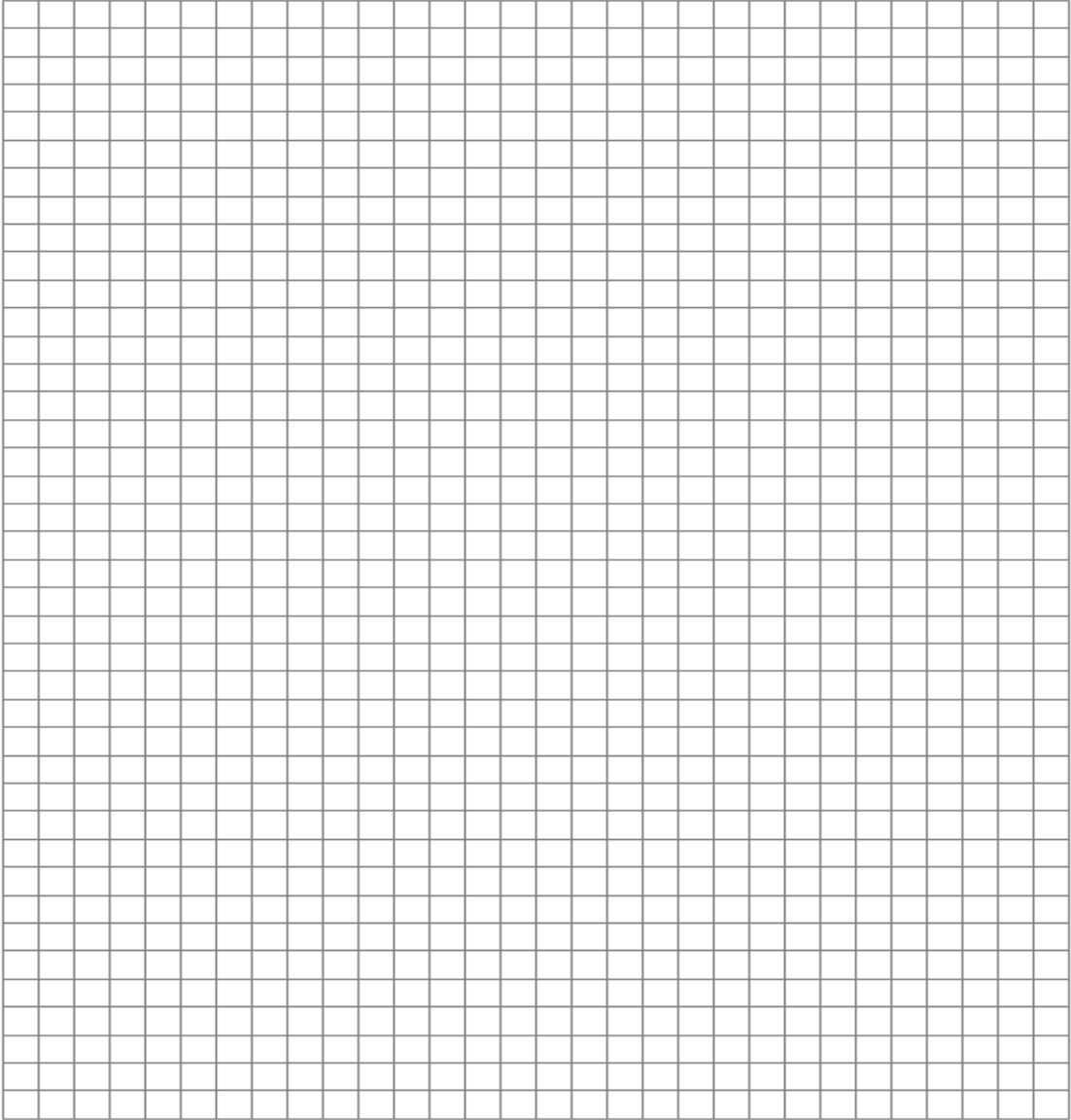
Activity 2: Fit It!

Now that you have the prior years plotted, you must predict how many people are coming to the party. To do this, you should take the information in Activity 1 and find/write a line of best fit with your answer rounded to the nearest hundredth, when necessary. Let the year 2007 correspond to x = 0.

a. Choose two points ON your line of best fit. (Points should be written as ordered pairs)
Point 1: _____   Point 2: _____
b. Using your two points, calculate the slope of the the line of best fit. (Show and/or explain all work.) $$m = \frac{y_2 - y_1}{x_2 - x_1}$$ Calcworkshop.com

c. Using the slope and a point you have found, calculate the y-intercept (b). (Show and/or explain all work.)

d. Write the equation of the line in slope-intercept form: (use y = mx+b)

Activity 3: Predict It!

Rewrite the Line of Best Fit from Activity 2, Part d

Write the Line of Best Fit	

Using your line of best fit, predict the number of people who will attend the party in 2020. Show and/or explain all work.

How many people do you predict will attend the party in 2020?	

Task 2: Raise the Funds

Activity 1: Line It Up!

You have figured out how many classmates are attending the party. Now it's time to figure out how much money you have. As a class, you have been fundraising since your freshman year. Let's see the progress your class has made and decide where to go from here.

The table below shows the funds raised during the first six months of your senior year, with August as the first month.

Write a linear equation in the form y = mx + b that represents the amount of money raised given the months (x) and running balance (y). Let August correspond to x = 1.

Months (x):	Running Balance (y):
August	$1,000
September	$1,250
October	$1,500
November	$1,750
December	$2,000
January	$2,250

a. Choose two points from your table (Points should be written as ordered pairs)

Point 1: _____   Point 2: _____

b.   Using your two points, calculate the slope of the line. (Show all work.) Explain the meaning of the slope in the context of this situation.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

_____   Calcworkshop.com

c. Calculate the y-intercept, b. (Show all work.) Explain the meaning of the y-intercept in the context of this situation.

d. Write the equation of the line

Activity 2: Graph It Out!

Now that you have the equation, you decide to create a graph to better visualize the data and analyze the information.

| |
|---|
| a. **Graph the linear equation from Activity 1, Task 2, on the coordinate plane provided. Determine the scale for the x-axis and the scale for the y-axis. (These do not have to be the same scale.)** |
| 1. **Determine the scale you will use for your x-axis and explain why.** |
| **x scale:** |
| **Explanation:** |

2. Determine the scale you will use for the y-axis and explain why.
y scale:
Explanation:

3. Now graph the function.
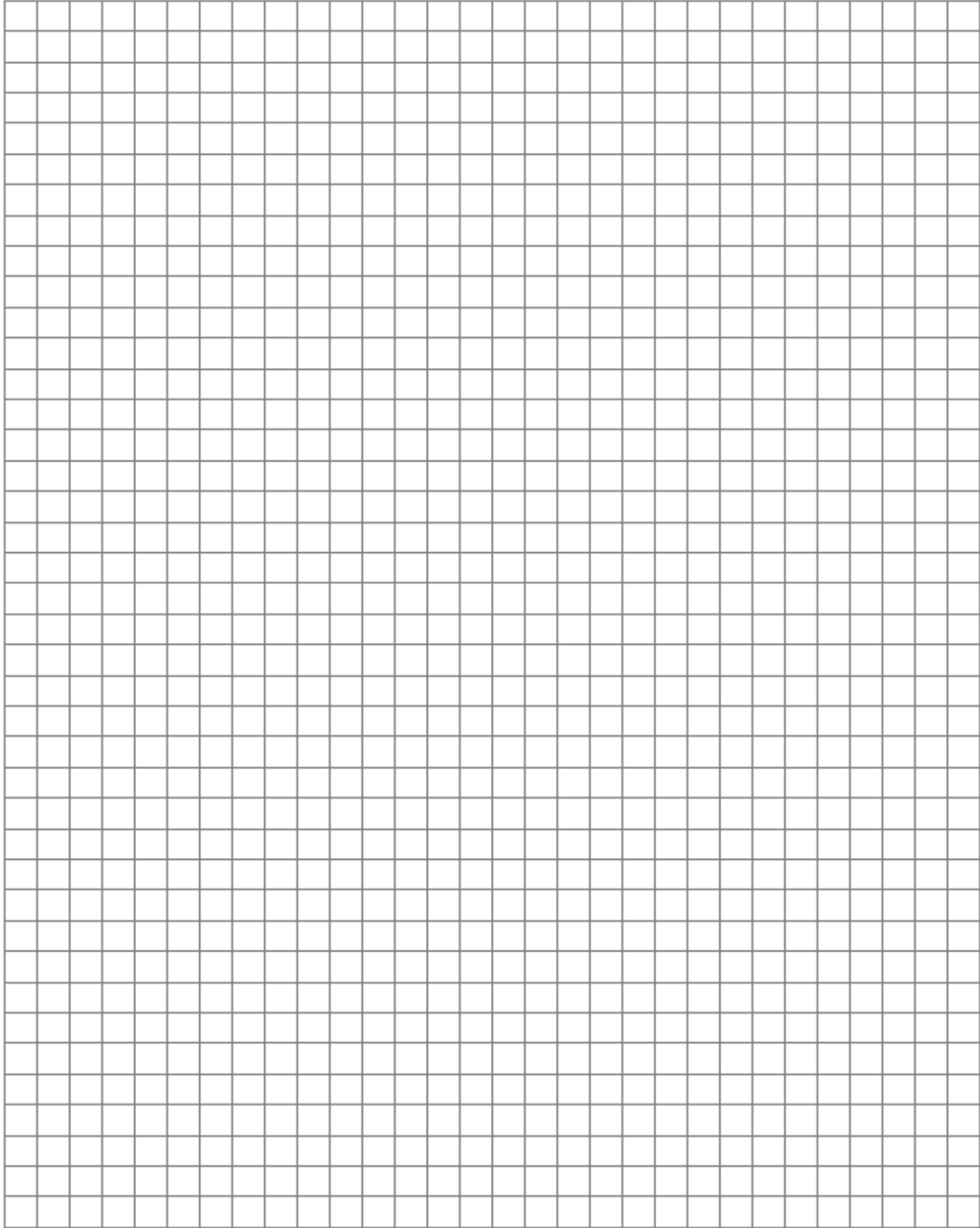
b. **What is a reasonable domain for this line? Provide your explanation in the space below.**

c. **What is a reasonable range for this line? Provide your explanation in the space below.**

d. Does this equation represent a function? Provide your explanation in the space below.

Activity 3: Predict It!

Now that you know how much money has been raised, make a prediction about how much money and/or time you need to complete the following scenarios.

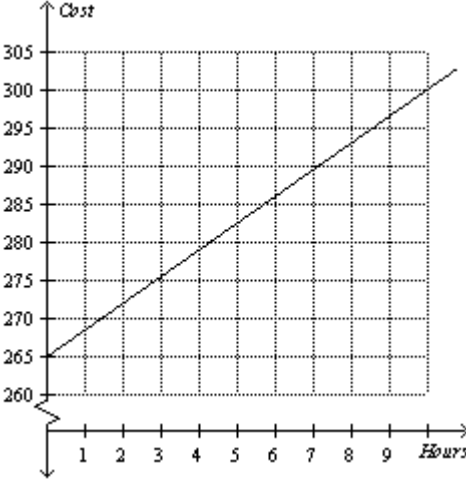| a. You need to raise $2,750. At the end of what month will you accomplish this task? Show or explain your work. (Use your equation from Activity 1.) |
| --- |
| |

b. If you continue to raise money until May, how much money will you have all together?

   Show or explain your work. (Use your equation from Activity 1.)

Task 3: Where's the Party?

Activity 1: The School Gymnasium?

The senior class advisor decides the party will be a 5-hour event. No decision has been made about the location. Three committees are created to evaluate three potential locations for the party. After their investigation into locations, the committees returned with the following information. To make sure you have enough money for entertainment and food, it is your duty to analyze the findings to figure out which facility is the most economical or cost effective. Below you will find three locations, one from each committee. Let *h* **represent the number of hours and** *C* **represent the cost to rent the location.**

Committee 1	Committee 2	Committee 3
The School Gymnasium	Community Park	Banquet Hall
The school gym can be rented for 2 hours at a cost of $120 and can be rented for 4 hours at a cost of $240.	C = $275	

After looking over the information, you notice that the committees evaluated information differently. You need to figure out how to calculate the best deal. To do this, you need to write the committees' information/data in the same format.

You decide to start with the school gymnasium and determine the rental costs .

Gymnasium

a. Calculate the cost per hour to rent the school gymnasium. Provide units on your answer.

b. Write an equation for the cost to hold the party in the school gymnasium. Let *h* represent the number of hours and *C* represent the cost to rent the location. (Show all work.)

Activity 2: Community Park?

You have assessed the school gymnasium. Now you must evaluate the community park.

a. What is the rental fee for the community park regardless of the number of hours rented?

b. Given C = $275 for the cost of a Community Park, what is the slope in this situation? What does it represent?

Activity 3: Banquet Hall?

Now it's time to determine if the banquet hall is a good choice.

a. Calculate the cost per hour (rate of change) for the banquet hall. Provide units on your answer and show and/or explain all your work.

b. Determine the rental fee for the banquet hall. Provide units on your answer and explain how your got your answer.

c. Write an equation for the cost based on the number of hours the banquet hall is rented. Let *h* represent the number of hours and *C* represent the cost to rent the location.

Activity 4: Which is the Best?

Now that all of your information is in the same format, you need to determine which location is the most economical choice.

Rewrite the answers you got for your equations from the previous activities:

School Gymnasium:	
Community Park:	
Banquet Hall:	

a. If you are planning for a 5 hour party, calculate the total cost for each venue. Show and/or explain your work.	
Venue	**Cost**
School Gymnasium	
Community Park	
Banquet Hall	

b. **Which location is the most economical? Justify your answer mathematically.**

Task 4: Feed Me!

Activity 1: Food Choices

Everyone needs to eat. As the chairperson of the committee, you survey some members of the senior class to find out what they would like to eat at the party.

A random sample of food choices from 25 classmates has been collected. They were asked what entrée they would like to eat at the party. The results are shown in the following circle graph.

Choice of Entree

- Chicken
- Beef
- Pork
- Pasta
- Vegetarian
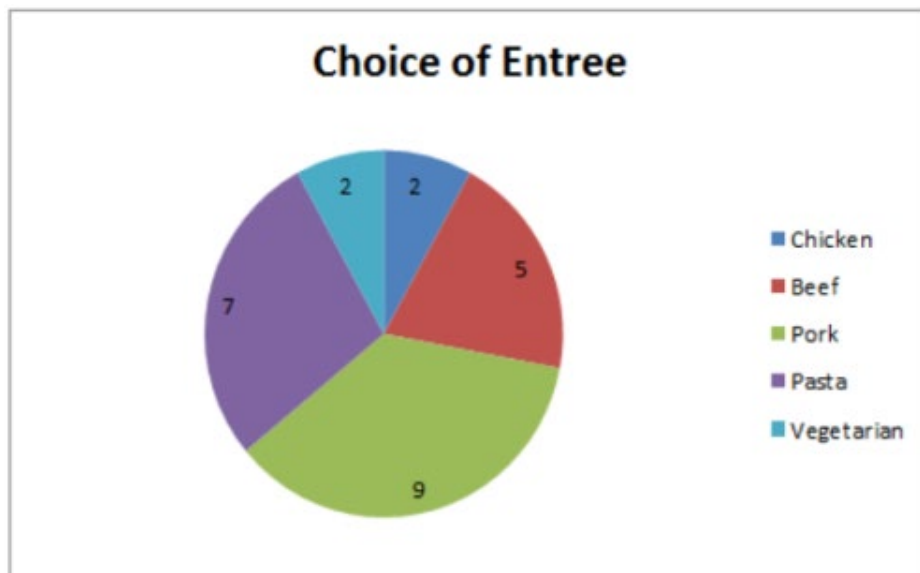
Your committee is expecting 150 students to attend the party. Based upon the survey, how many of each entree should be ordered? Show all work

Chicken	
Beef	
Vegetarian	
Pork	
Pasta	

Activity 2: Food Costs Per Person

Now that you know what kinds of food your classmates would like to eat, you need to find the best deal on food. You create a food committee to help you decide. They received quotes from ten different catering companies. The results of the cost per student are listed in the table below.

Catering Company	Cost per Student
Feed Me	$8.00
Lots-O-Food	$8.25
What the Spoon	$8.75
Knife and Simple	$9.25
Plate - O - Food	$9.50
Meals and Wheels	$18.00
Foods - R - Us	$10.75
Knife is Right	$8.25
Silver Spoon	$9.25
Eat it Up	$8.25

a. Using this data, find the mean, median, and mode of the data. Show all work.

Mean:

Median:

Mode:

b. What is the range of the data? Show all work.

Range:

Now that you have calculated the measures of central tendencies, you need to figure out which catering company to choose. You notice the mean, median and mode are completely different.

c. Which central tendency is the best representation of this data. Why? Provide your explanation in the space below:

d. Which catering company's cost per student is cheapest but closest to the measure of central tendency you chose in Part c?

e. Using the above company for the estimated 150 students, calculate the food cost. Show all work.

Task 5: Let's Get This Party Started!

Activity 1: Box Me with Entertainment!

Now that you have a location and food, it is time to pick entertainment for the party. You create a committee to research prices of various forms of entertainment. The data has been compiled in the following table.

Entertainment	5 Hour
2 Caricaturists	$750
Climbing Wall w/Attendants	$540
DJ	$400
Magician	$600
Photo Booth w/Attendants	$620
2 Balloon Animal Creators	$400
Face painting by Student Government	$15
2 Dunk Tanks	$350
Bouncing House	$500

Your committee created a box-and-whisker plot to organize the above data. You are asked to come up with a price for entertainment that would be the best representation of all of the choices.
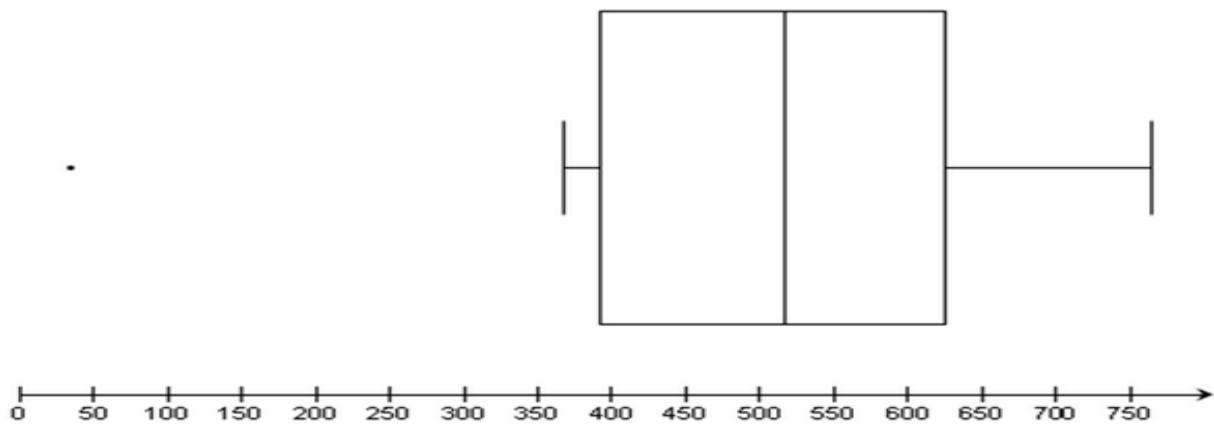
Given the data set and box-and-whisker plot above, answer the following questions:

a. What is the range of the cost for entertainment? Show all work.

b. Are any outliers represented? Explain what an outlier means in relationship to the data.

c. Using the box-and-whisker plot, what percent of the data lies between 15 and 610?

d. What is the interquartile range of the data? What percentage of the data does this value represent? Show and explain all work.

Activity 2: Probability – So What's My Chance?

As the chairperson, you decide to have a ticket auction at the party to help the junior class fundraising effort. You really want to win the $100 music card. Based on the number of students attending the party, you predict that a total of 370 tickets will be sold. In order to win a prize, you must place your tickets in the corresponding envelope of each prize. Based on the type of prizes, you predict the distribution of tickets as shown below. You decide to purchase 18 tickets and place them accordingly. Calculate the probability that you will win each prize and enter your answer in the box provided. Show all work.

Prize	Number of Tickets You Entered in the Drawing	Number of Total Tickets in the Drawing	Find Probability of each in fraction form (make sure to reduce all fractions when applicable)	Find Probability of each in decimal form (round to the nearest ten thousandths)	Find Probability of each in percent form (round to the nearest tenth of a percent)
Beauty Salon Gift Card	1	13			
Restaurant Gift Card	3	23			
$100 Debit Card	6	80			
$100 Music Card	8	67			
2 Amusement Park Passes	0	187			

Using the above information, calculate the following. Be sure to show or explain how you arrived at your answer. State your answers in percent notation, rounded to the nearest percent.

a. What is the probability for you to win either the $100 debit card or the $100 music card? Show all work.

b. **What is the probability for you to win both the $100 debit card and the $100 music card? Show all work.**

Task 6: Is There Enough Money?

Activity 1: Location, Location, Location!

Now that you have all of the choices in front of you, it is time to compile a list of decisions to present to the senior class advisor. You need to pick location, two forms of entertainment, and a given food cost. What are you going to choose?

Referring to Task 3, Activity 4, part a, which location was the cheapest?

Location:	
Price:	

Activity 2: Feed Me!

Referring to Task 4, Activity 2, part e, which catering company did you choose?

Company:	
Price:	

Activity 3: Entertainment!

Given that your senior class raised $2,300, and that you just calculated the amount spent on the location and food, select entertainment choice or choices that your class can afford using the table below

Entertainment	5 Hour
2 Caricaturists	$750
Climbing Wall w/Attendants	$540
DJ	$400
Magician	$600
Photo Booth w/Attendants	$620
2 Balloon Animal Creators	$400
Face painting by Student Government	$15
2 Dunk Tanks	$350
Bouncing House	$500

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Amount Spent on Location and Food:	Cost: _____
Amount Remaining for Entertainment:	Money Remaining: _____
Entertainment Choice(s):	Cost: _____
Total Cost:	