

Linear Programming Choices

ACTIVITY 1.1

SUGGESTED LEARNING STRATEGIES: Shared Reading, Marking the Text, Graphic Organizer

My Notes

Roy recently won a Trivia Contest. The prize was a five-day trip to New York City, including a round-trip airplane ticket and \$3000 in cash. The money will pay the cost of a hotel room, meals, entertainment, and incidentals. To prepare for his trip, Roy gathered this information.

- A hotel room in New York City costs \$310 per night, and the trip includes staying five nights.
- A taxi between New York City and LaGuardia Airport will cost \$45 each way.

Roy must set aside the cash required to pay for his hotel room and for taxi service to and from the airport. Once he has done this, Roy can begin to make plans to enjoy the city with his remaining prize funds.

1. How much money will Roy have available to spend on performances, meals, and any other expenses that might arise after paying for his hotel and taxis? Show your work.

During his trip to New York City, Roy wants to spend *only* his winnings from the contest. He wants to focus on two of his favorite pastimes: attending theater or musical performances and dining in restaurants. After surfing the Web, Roy determines several facts.

- On average, a ticket for a performance in New York City costs \$100.
- He will spend on average \$40 per meal.

ACTIVITY 1.1

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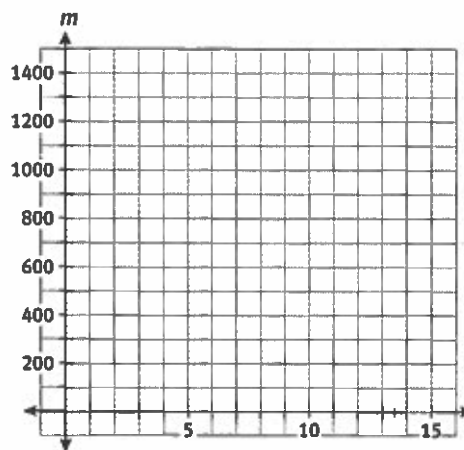
Linear Programming Choices

SUGGESTED LEARNING STRATEGIES: Create Representations, Look for a Pattern, Quickwrite, Group Presentation

My Notes

2. Roy wants to know how the purchase of each ticket affects his available money. Fill in the table below. Plot the points on the grid.

Tickets (t)	Money available (M)
0	
1	
2	
3	
4	
5	
8	
10	
13	



MATH TIP

Looking at rate of change can help you determine the type of function.

3. What patterns do you notice?

4. Explain how you determined the values for 8, 10 and 13 tickets.

5. Write a function $M(t)$ that represents the amount of money that Roy has left after purchasing t tickets.

Linear Programming Choices

ACTIVITY 1.1

continued

SUGGESTED LEARNING STRATEGIES: Think/Pair/Share, Quickwrite, Create Representations, Look for a Pattern, Activate Prior Knowledge, Interactive Word Wall

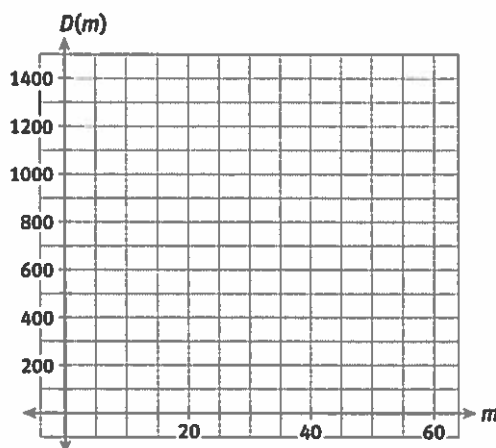
My Notes

6. Use mathematical terminology to explain what -100 and 1360 each represent in your function in Item 5.

7. Roy wonders how his meal costs will affect his spending money.

a. Write a function $D(m)$ that represents the amount of money Roy has left after purchasing m number of meals.

b. Graph your function on the grid.



8. What kind of function is $D(m)$?

9. What is the rate of change for $D(m)$, including units?

10. Are all the values for m on your graph valid in this situation, given that m represents the number of meals that Roy can buy? Explain.

ACTIVITY 1.1

continued

Linear Programming**Choices****SUGGESTED LEARNING STRATEGIES:** Think/Pair/Share, Create Representations, Work Backward, Discussion Group

My Notes

MATH TERMS

The term **feasible** means that something is possible in a given situation.

11. Roy's spending money depends on both the number of tickets t and the number of meals m . Determine whether each option is feasible for Roy and provide a rationale in the table below.

Tickets (t)	Meals (m)	Total Cost	Is it feasible?	Rationale
6	16			
8	14			
10	12			
4.5	11			

12. For all the ordered pairs (t, m) that are feasible options, explain why each statement below must be true.

- All coordinates in the ordered pairs are integer values.
 - If graphed in the coordinate plane, all ordered pairs would fall either in the first quadrant or on the positive m -axis.
13. Write an inequality that represents all ordered pairs (t, m) that are feasible options for Roy.
14. If Roy buys exactly two meals each day, determine the total number of tickets that he could purchase in five days. Show your work.
15. If Roy buys exactly one ticket each day, find the maximum number of meals that he could eat in the five days. Show your work.