



Objective

Structure of Linear Equations

Warm-Up

Use properties to rewrite.

1. $3(x - 1)$

2. $-9(-2 + x)$

3. $8(x - 6)$

4. $6 + 3(x + 4)$

Show You KNOW

Learning the Limo Business

Katie is starting her own limousine rental company. She wisely decides to check her competitors' pricing plans before setting her own plan. The table shows the fees from two rival limousine rental companies.

Examine the fee schedule for the two limousine companies provided in the table.

Number of Hours Rented	Limousines by Lilly Fees (in dollars)	Transportation with Class Fees (in dollars)
1	99.99	89.99
2	123.74	126.54
3	147.49	163.09
4	171.24	199.64
5	194.99	236.19

1. Which company would you choose if you were renting a limousine? Support your answer with information from the table.



Katie starts by analyzing the cost structure of Limousines by Lilly.

1. Consider the cost of renting a limousine from Limousines by Lilly.

a. What does the first hour of a rental from Limousines by Lilly cost?

b. What does each additional rental hour cost from Limousines by Lilly after the first hour?

c. What would it cost to rent a limo from Limousines by Lilly for 10 hours? Explain your reasoning.

d. What would it cost to rent a limo from Limousines by Lilly for 13 hours? Explain your reasoning.

e. Explain how you calculated each cost.

You can rewrite your equation for Limousines by Lilly before using it to solve problems. Previously, you have learned to simplify algebraic expressions using a variety of strategies.

3. Rewrite your equation in the form $ax + b = c$.

a. Name the strategies necessary to rewrite the equation you wrote.

b. Rewrite the equation you wrote for Limousines by Lilly. Explain why the resulting equation is a two-step equation.

c. Compare the two equations you wrote for this company. What is the same? What is different?

d. Write a possible fee scenario for Limousines by Lilly to match the rewritten equation.

4. Use your equation to calculate how many hours you rented from Limousines by Lilly if the total cost is \$266.24.

5. Consider the cost of renting a limousine from Transportation with Class.

a. What does the first hour of a rental from Transportation with Class cost?

b. What does each additional rental hour cost from Transportation with Class after the first hour?

c. Write an equation for the total cost, t , of renting from Transportation with Class for any given number of rental hours, h .

d. Rewrite your equation in the form $ax + b = c$.

e. Write a possible fee scenario for Transportation with Class to match the rewritten equation.

f. Use your equation to determine the number of hours that cost \$309.29 from Transportation with Class.

6. What suggestions would you provide to Katie on the fees she should charge for her limo rental business? Explain your reasoning.



LESSON 9.2a
Stretches, Stacks, and Structure



Objective **Structure of Linear Equations**

Review

1. The winner of the 95th annual hotdog eating contest consumed 207 hotdogs (and buns!) in 10 minutes. You are determined to break this record!
 - a. What would you have to do to break this record?

 - b. How many hotdogs would you have to eat every minute?

2. The 96th annual contest begins at noon. Your best friend got caught in traffic and arrives halfway through the event.
 - a. How many hotdogs have you consumed?

 - b. Assuming you eat at the average rate needed, after the arrival of your best friend, how many total hotdogs will you consume in one minute? two minutes? three minutes?

 - c. Identify and define the independent and dependent variables with their units of measure for this situation.

 - d. Create a table of values for the in minutes after 12:05 PM and the number of hotdogs consumed.

 - e. Write an equation for calculating the value of the dependent variable when the value of the independent variable is given.

 - f. Use your equation to determine how long after 12:05 PM it will take you to consume 187 hotdogs.

 - g. Use your equation to determine when you would have consumed a total of 83 hotdogs.

 - h. What does the answer to part (g.) mean in this problem situation?