Objective   **Representing Equations with Tables and Graphs**

Warm-Up

Angela charges $35 an hour for tutoring services plus a $5 travel fee if she has to go to the student's house.

1. Name the quantities that are changing in this problem situation.

2. Name the quantities that remain constant.

3. Write an equation for the amount Angela charges, assuming she must travel to the student's house.

4. If Angela made $75, how many hours did she tutor?

It's All Greek to Me

Ms. Jackson translates books for a living. She decides to change her fees to keep up with the cost of living. She will charge an initial fee of $325 to manage each project and $25 per page of translated text.

Ms. Jackson does not consider partial pages in her fees.

1. Name the quantities that change in this problem situation.

2. Name the quantities that remain constant.

3. Which quantity depends on the other?

You can represent a problem situation in many ways. You used verbal descriptions to represent the relationship between the number of pages Ms. Jackson translates and her total fees. Let's consider how to represent the relationship with tables and graphs.

1. Copy and complete the table that shows the various projects that Ms. Jackson has managed recently.

When representing a relationship as a graph, you need to ensure that the bounds of your graph are an appropriate size to surround the data from the table.

2. What is the least number of pages that Ms. Jackson could translate? What is the greatest number of pages that Ms. Jackson has translated recently?

| Number of Pages	Total Fees for the Project (dollars)
1	
2	
	400
	425
10	
	1150
	2100
92	

3. What are the least and greatest amounts of money that Ms. Jackson has earned?

4. Consider the ranges of values in the table to choose lower and upper bounds for the x- and y-axes. Copy and write the lower and upper bound values in the table shown for each quantity.

Variable Quantity	Lower Bound	Upper Bound	Interval
Pages Translated			
Earnings			

5. Calculate the difference between the upper and lower bounds for each quantity and the number of tick marks that you have on each axis. Then, choose an appropriate interval for each axis and write these in the table.

6. Use the bounds and intervals to label each axis. Then, create a graph of the data from the table.

y

Total Fees (dollars)

Pages Translated

x
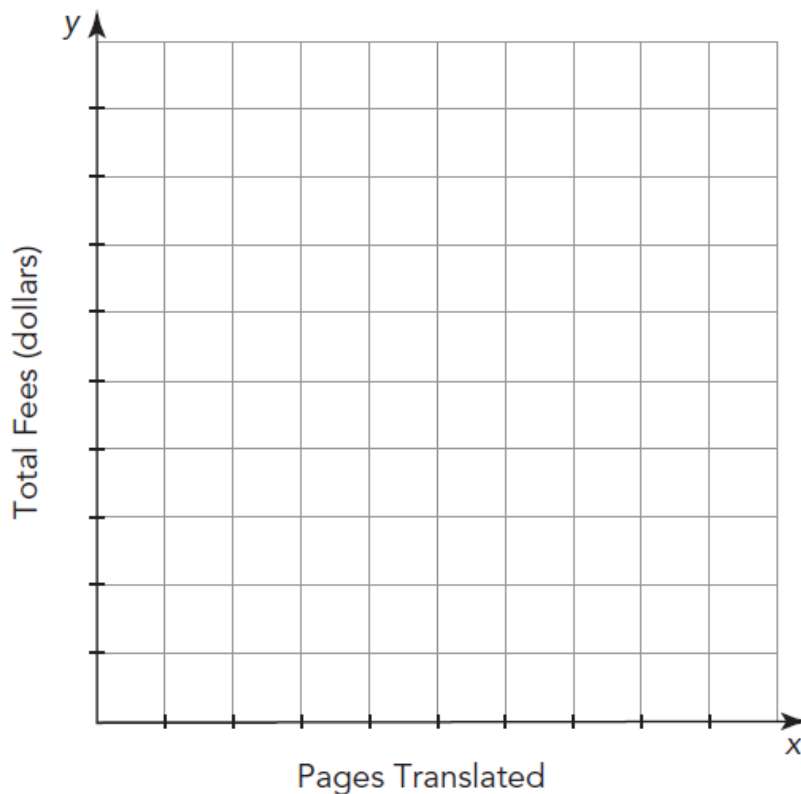
7. Are the data continuous or discrete? Explain your reasoning.

8. Describe the relationship between the two quantities represented in the graph.

9. Write a linear equation to represent this situation. Make sure to define your variables.
When you first analyzed this situation, you listed two quantities that remain constant in this scenario: $325 and $25 per page.

10. Refer to your equation and graph to answer each question.

a. Where is $325 represented in the graph and in the equation?

b. Where is $25 per page represented in the graph and in the equation?

11. Is there a proportional relationship between the number of pages translated and Ms. Jackson's earnings? Justify your answer using the table, equation, and graph.

12. Use the graph to answer each question. Explain your reasoning.

a. Approximately how much money would Ms. Jackson earn if she translated 57 pages?

b. Approximately how many pages would Ms. Jackson need to translate to earn $750?

13. For each translating project Ms. Jackson completed this month, determine if her pay was correct. If it is not, state the amount she should have received. Explain each answer in terms of the equation and the graph.

a. Ms. Jackson translated a 23-page technical manual for Technicians Reference Guide Inc. She received a check for $900.

b. Ms. Jackson translated a 42-page year-end report for Sanchez and Johnson Law Office. She received a check for $1050.

c. Ms. Jackson translated a 35-page product specification document for Storage Pros. She received a check for $2075.

You have represented the situation with Ms. Jackson's book translation business multiple ways: as a scenario, in a table, with an equation, and on a graph. These representations are useful for analyzing the situation in different ways.

LESSON 9.1a
Put It on the Plane

Objective Representing Equations with Tables and Graphs

Practice

1. Ben joins a book club. He pays $12 for each book and $5 for shipping and handling charges for each order.

a. Name the quantities that change in this problem situation and the quantities that remain constant. Determine which quantity is independent and which quantity is dependent.

b. Create a table of values to represent the total cost if Ben orders 1 or 2 books or spends $41, $65, or $125.

c. Create a graph of the data from the table. Carefully select the lower bound, upper bound, and intervals. Remember to label the axes and the intervals.

d. Describe the relationship between the two quantities. Define your variables.

e. Ben said that he spent exactly $80 on a book order. Use your graph to determine if Ben is correct.

f. Write an algebraic equation to represent the situation.

g. Use the equation, table, and graph to explain if this situation represents a proportional relationship.