

Same rate for each pair of numbers
Constant of Proportionality

not all pairs have the same rate.

Lesson 3: Identifying Proportional and Non-Proportional Relationships in Tables

Classwork

Example

You have been hired by your neighbors to babysit their children on Friday night. You are paid \$8 per hour. Complete the table relating your pay to the number of hours you worked.

rate

Hours Worked	Pay
1 $\times 8$	8
2 $\times 8$	16
3 $\times 8$	24
4	32
$4\frac{1}{2}$	$32 + 4 = 36$
5	40
6	48
6.5	52

$(4 \times 8) + (\frac{1}{2} \times 8)$
 $4.5 \times 8 =$

Based on the table above, is the pay proportional to the hours worked? How do you know?

Yes, each pair of numbers has the same rate.

$\frac{8}{1} = 8$ $\frac{16}{2} = 8$ $\frac{24}{3} = 8$ $\frac{32}{4} = 8$ $\frac{32}{4\frac{1}{2}} = 8$ $\frac{40}{5} = 8$

$\frac{48}{6} = 8$ $\frac{52}{6.5} = 8$

Exercises

For Exercises 1–3, determine if y is proportional to x . Justify your answer.

1. The table below represents the relationship of the amount of snowfall (in inches) in 5 counties to the amount of time (in hours) hours of a recent winter storm.

x Time (h)	y Snowfall (in.)
2	10
6	12
8	16
2.5	5
7	14

$k = \frac{y}{x}$

~~$\frac{10}{2} = 5$~~

$\frac{12}{6} = 2$

$\frac{16}{8} = 2$

$\frac{5}{2.5} = 2$

$\frac{14}{7} = 2$

y (snowfall) is not proportional to x (time) because all of the rates are not the same.

2. The table below shows the relationship between the cost of renting a movie (in dollars) to the number of days the movie is rented.

x Number of Days	y Cost (dollars)
6	2
9	3
24	8
3	1

Lesson 4: Identifying Proportional and Non-Proportional Relationships in Tables

Classwork

Example: Which Team Will Win the Race?

You have decided to walk in a long distance race. There are two teams that you can join. Team A walks at a constant rate of 2.5 miles per hour. Team B walks 1 miles the first hour and then 2 miles per hour after that.

Task: Create a table for each team showing the distances that would be walked for times of 1, 2, 3, 4, 5, and 6 hours. Using your tables, answer the questions that follow.

$k = \frac{y}{x}$

$\frac{2.5}{1} = 2.5$
 $\frac{5}{2} = 2.5$
 $\frac{7.5}{3} = 2.5$
 $\frac{10}{4} = 2.5$
 $\frac{12.5}{5} = 2.5$
 $\frac{15}{6} = 2.5$

Team A	
Time (h) x	Distance (miles) y
1	2.5
2	5
3	7.5
4	10
5	12.5
6	15

Team B	
Time (h) x	Distance (miles) y
1	4
2	6
3	8
4	10
5	12
6	14

$\frac{4}{1} = 4$
 $\frac{6}{2} = 3$
 $\frac{8}{3} = 2.67$
 $\frac{10}{4} = 2.5$
 $\frac{12}{5} = 2.4$
 $\frac{14}{6} = 2.33$

- a. For which team is distance proportional to time? Explain your reasoning.

Team A has a distance proportional to time. Each pair of numbers has the same rate:
 $k = 2.5$

- b. Explain how you know distance for the other team is not proportional to time.