

# Notes - Proportional Relationships in Graphs

## Proportional Relationships in Graphs

### Constant of Proportionality

A Constant of Proportionality exists when the ratio of two quantities in a table, graph, or ordered pairs simplify to the same unit rate.

To check if there is a constant of proportionality:

- From Ordered Pairs/Tables: Find the unit rate for all ordered pairs ( $y$  divided by  $x$ ). The unit rate must be the same for all pairs.
- From a Graph: Create a table of ordered pairs, then check all ordered pairs by dividing  $y$  by  $x$ .

### Find the Constant of Proportionality (if it exists)

- a. (2, 53), (4, 108), (0.5, 13.25)      b. (15, 9), (78, 46.8)

### Find the Constant of Proportionality (if it exists)

x	y
0	0
1	5
2	10
3	15
4	20

Days	0	1	2	3
Hours of Homework	0	4	6	9

C.O.P = \_\_\_\_\_

x	y
0	0
4	11.2
6	16.8
8	22.4
10	2.8

C.O.P = \_\_\_\_\_

C.O.P = \_\_\_\_\_

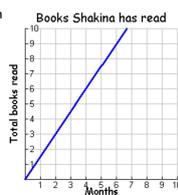
### Proportionality in Graphs

A graph is proportional if:

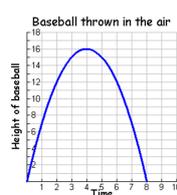
- > It is linear (a straight line).
- > It goes through the origin (0,0)



- \_\_\_ Linear  
\_\_\_ Origin  
\_\_\_ Is it proportional?



- \_\_\_ Linear  
\_\_\_ Origin  
\_\_\_ Is it proportional?



- \_\_\_ Linear  
\_\_\_ Origin  
\_\_\_ Is it proportional?

### Hot Dog Eating Contest

Does the graph represent a proportional relationship?  
How do you know?



What is the constant of proportionality?

What is an ordered pair on the graph that makes the constant of proportionality easy to determine?

What does the ordered pair (0,0) represent in this graph?

What is an equation that would represent the relationship shown in the graph?

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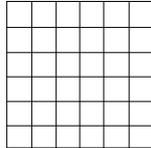
## Multiplication Problems

Joe can do 10 multiplication problems in 5 seconds.

1. At this rate, how long should it take Joe to do 2 multiplication problems?

2. Create a table of values showing how long should it take him to do from 0 to 5 multiplication problems. Then graph the points on the coordinate plane.

Problems	0	1	2	3	4	5
Seconds						



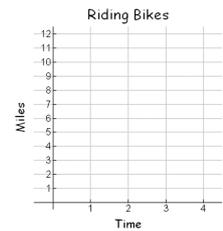
3. Is the graph proportional? Explain why or why not.

## Grandma Betty

Grandma Betty rode her bike on the Tobacco Trail. It took her 4 hours to ride 12 miles. Assume she rode at a constant rate of speed during her exercise.

Fill in the table below and draw the corresponding graph to the right.

Time in hours (x)	4	2	0		
Miles Ridden (y)	12			9	3



What is the constant of proportionality?

What is the ordered pair where  $x=1$ ? (1, \_\_\_\_\_)

Write an equation relating miles ridden (y) and time in hours (x)

## Grandma Betty

Grandma Betty doesn't always ride 12 miles, but she always goes the same pace.

Use your equation to find the missing information based on the given information of different exercise sessions.

a. Grandma Betty rode for 6 hours and 30 minutes. How far did she go?

b. Grandma Betty rode her bike for 15.75 miles. How long did it take her?

## Salt Water Taffy

You want to buy some candy for your birthday party. You go to two different grocery stores and see the following special offers.

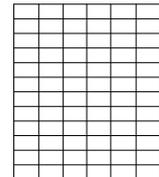
OFFER 1: 3 lbs for \$4.50

OFFER 2: \$1.75 / lb

Complete the table for each offer. Graph each offer on the coordinate plane.

OFFER 1	Pounds (x)	Dollars (y)
	1	
	2	
	3	

OFFER 2	Pounds (x)	Dollars (y)
	1	
	2	
	3	



Offer 1's constant of proportionality: \_\_\_\_\_

Offer 2's constant of proportionality: \_\_\_\_\_

Which is the better deal for Salt Water Taffy? How do you know?

## Attachments

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mental math division.ppt