PROPORTIONALITY USING GRAPHS AND TABLES

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PROPORTIONAL RELATIONSHIPS

- We can use our knowledge of ratios and proportions to determine if there is a proportional relationship between different elements.
- Relationships are usually represented using a graph or a table.
- We can use the graphs and tables to test the proportionality.

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USING A TABLE

- In order to tell from a table if there is a proportional relationship or not, you can check to see if the ratio **y : x** is the same.

- The ratio **y : x** is also known as the **constant of proportionality**.

- You must reduce the ratios to accurately compare!

3

EX .Tell if the following tables represent a proportional relationships.

x	y	y:x =y/x
5	10	10/5 = 2/1
8	16	16/8 = 2/1
10	20	20/10 = 2/1
14	28	28/14 = 2/1
21	42	42/21 = 2/1

•This is a proportional relationship because the y: x ratios are all equal!

•The constant of proportionality is 2/1 (or 2)

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EX .Tell if the following tables represent a proportional relationships.

x	y	y:x =y/x
6	9	9/6 = 3/2
10	15	16/10 = 3/2
4	20	20/4 = 5/1
14	21	28/14 = 3/2
22	44	42/21 = 2/1

•This is NOT a proportional relationship because the y: x ratios are not all equal!

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PRACTICE

o Are the following tabled representing proportional relationships?

X	Y
1	4
2	8
3	9

X	Y
4	6
6	9
10	15

6

QUICK REVIEW OF GRAPHING

- Ordered Pair - A pair of numbers (x , y)used to locate a point on a coordinate plane.
  - Also called a point.
- Using the table below, create a list of ordered pairs.

X	Y
1	4
3	8
2	6
8	10

(1,4) , (3,8), (2,6), (8,10)

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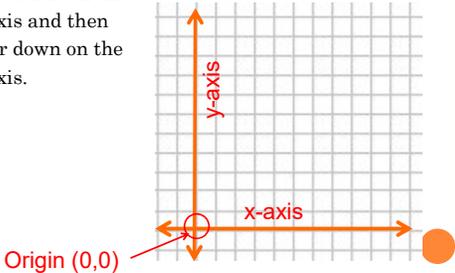## QUICK REVIEW OF GRAPHING

- When we plot points on the grid (coordinate plane), we start at the origin then count :
1. right or left on the x-axis and then
1. up or down on the y-axis.

y-axis

x-axis

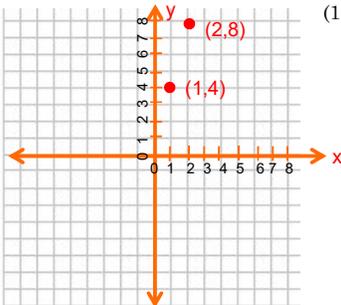Origin (0,0)

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QUICK REVIEW OF GRAPHING

- Plot the following points (write the ordered pairs on the grid)

y

(2,8)

(1,4)

x

(1,4) and (2,8)

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USING A GRAPH

- We can test for proportionality on a graph by looking for various properties.
1. A proportional graph will always go through the origin (0,0)
2. A proportional graph will be a straight line.
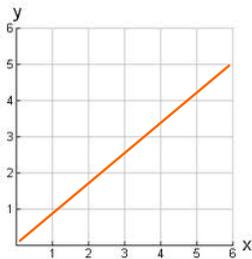3. If you list points (ordered pairs) from a graph, you can create ratios and see if they are constant (equal).

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In order to tell if a graph is proportional the line must go through the origin and be a straight line.

- Straight line ?
Yes
- Passes through (0,0)?
Yes

- This is a proportional relationship!

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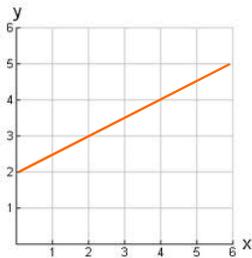

In order to tell if a graph is proportional the line must go through the origin and be a straight line.

- Straight line ?
Yes
- Passes through (0,0)?
No

- This is NOT a proportional relationship!

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In order to tell if a set of ordered pairs is proportional, look at the ratio of *y* to *x*.

Tell if the following set of ordered pairs represents a proportional relationship.

$$\{(8,\ 4),\ (10,\ 5),\ (5,\ 2.5),\ (12,\ 6)\}$$

- (x, y) ordered pairs are used to make ratios
- y: x = y/x

4/8 = 1/2
5/10 = 1/2
2.5/5 = 1/2
6/12 = 1/2

This is a proportional relationship because the ratios are **constant**

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USING AN EQUATION

•To determine if the following equations show a proportional relationship, put a zero in for x and solve for y.

•if y is zero then it is a proportional relationship because it goes through the origin.

y = 3x + 1

y = 3(0) + 1

y= 0 + 1

y= 1   Not Proportional

y = 10x

y = 10(0)

y= 0

Proportional

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GRAPHING PROPORTIONAL RELATIONSHIPS

1. Given a table
- Create a list of ordered pairs
- Plot the points on the grid
- Connect using a ruler
- Label axis

2. Given an equation
- Create a table
- Create a list of ordered pairs
- Plot the points
- Connect using a ruler
- Label axis

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GRAPHING GIVEN A TABLE

Hours X	Miles Y
0	0
1	3
2	6

Ordered pairs:
(0,0), (1,3), (2,6)

(2,6)

(1,3)

(0,0)

Hours

16

GRAPHING GIVEN AN EQUATION

y = 2x

1. Create a table by substituting value into x and solving for y. (need three points)

X	y=2x	Y
0	y= 2(0)= 0	0
1	y= 2(1) = 2	2
2	y=2(2) = 4	4

2. Ordered Pairs
(0,0), (1,2), (2,4)

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GRAPHING GIVEN AN EQUATION

3. Plot the points on the grid.

(0,0), (1,2), (2,4)

4. Connect the points

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