

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Physics Worksheet – Proportionality and Graphing

For each of these problems, determine an equation to describe the data set. When you make a graph in fathom, assume the 1st column in each set of values to be the **independent** variable and the 2nd column the **dependent** variable. Sketch the graph to the right of the table as you would for a white board – label each axis with symbol and units, and draw the best fit line or curve, but don't plot specific points. You will turn in your Fathom file separately, and it will have the points on it.

Shopping for CD's		Sketch of Graph
Compact Discs (Discs)	Cost (Dollars)	
2	28	
3	40	
4	56	
5	70	
6	82	
7	94	
8	110	
9	118	

- (a) Equation (written in the real names and including units for any constant):
- (b) Proportionality (written in the real names using the proportionality symbol,  $\alpha$ .)
- (c) Value, units and meaning of the constant (slider):
- (d) According to your equation, how much would 10 compact discs cost? How much would one cost?
- (e) You and your friend are buying CD's. You notice that your stack is three times as tall as your friend's stack of CD's. How much more will your's cost?

Filling the Swimming Pool		Sketch of Graph
Area of Hose Opening (cm <sup>2</sup> )	Time to Fill (hours)	
3	72	
18	12	
33	7	
48	4.5	
63	3.5	
78	3	
93	2.5	
108	2	

- (a) Equation (written in the real names and including units for any constant):
- (b) Proportionality (written in the real names using the proportionality symbol,  $\alpha$ .)
- (c) Value, units and meaning of the constant (slider):
- (d) The fire department drives by and sees you filling your pool with your garden hose. They offer to use the hose from their pump truck instead, which has an area of 150cm<sup>2</sup>? How long will it take with their hose?
- (e) It takes 10hours to fill the pool with your garden hose. How long will it take with a hose that has half the area?
- (f) How long will it take to fill your pool with a hose of 3 times the area of your garden hose?

Filling Buckets with Sand	
Diameter (in)	Weight (lb)
6	6
9	13.5
12	24
15	37.5
18	54
21	73.5
24	96
27	121.5

Sketch of Graph

- (a) Equation (written in the real names and including units for any constant):
- (b) Proportionality (written in the real names using the proportionality symbol,  $\alpha$ .)
- (c) Value, units and meaning of the constant (slider):
- (d) Suppose the diameter of a 10lb. Bucket of sand is doubled. By how much will its weight increase?
- (e) Suppose the diameter of the 10lb. Bucket is quintupled (x5). By how much will its weight increase?
- (f) Suppose the diameter of the 10lb. Bucket is cut by  $\frac{1}{3}$ . By how much will its weight increase?