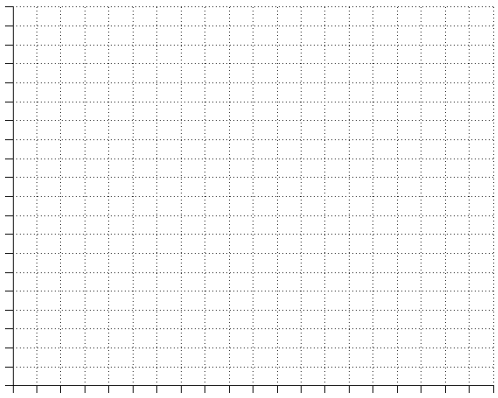
Name: _____ Phys 12

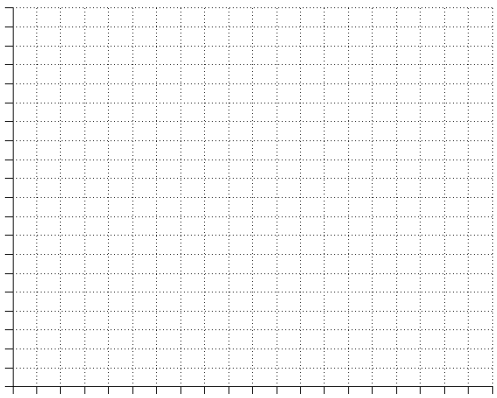
Graphing: Linearization

You may have seen the following graphs below:

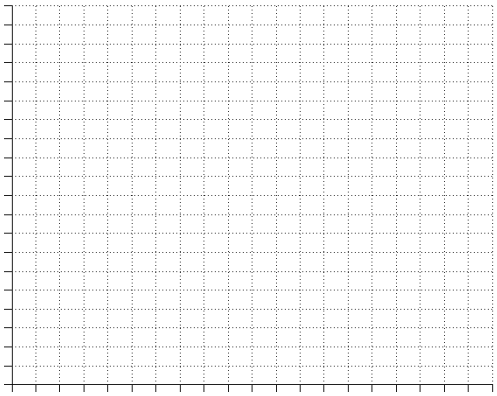
1)



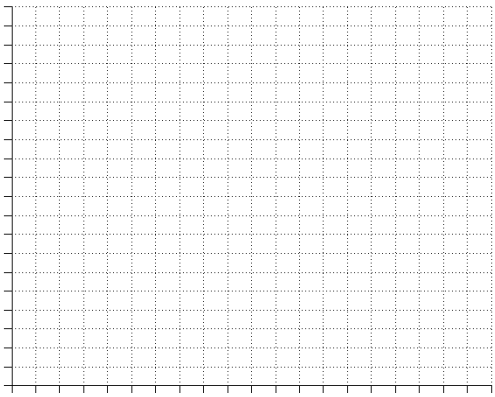
2)



3)



4)



You might notice that a best fit line does not work so well in most of the above situations.

Which one of these graphs best fit your data? _____

Since it is difficult to quantitatively analyze your graph, it is better if we **linearize** your graph. In other words, "straighten out" your graph. It is much easier to calculate slope from a linear graph than from a curved graph.

With a graph in the form of $y = mx + b$, it will be much easier to measure the slope.

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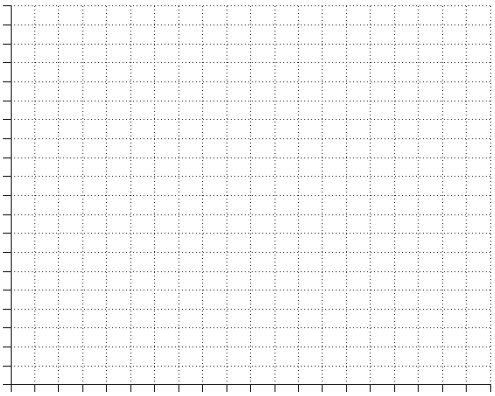
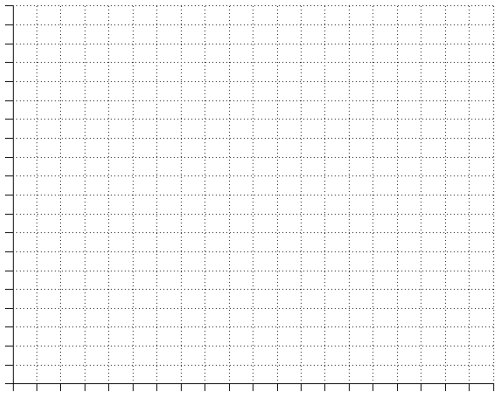
Example 1:

Let's say we want to figure out what "a" is in $y = ax^2$. How do we convert a graph like $y = ax^2$ to y = mx + b? What does the slope "m" mean in the linearized graph?

x		y
1		3
2		12
3		27
4		48
5		75
6		108

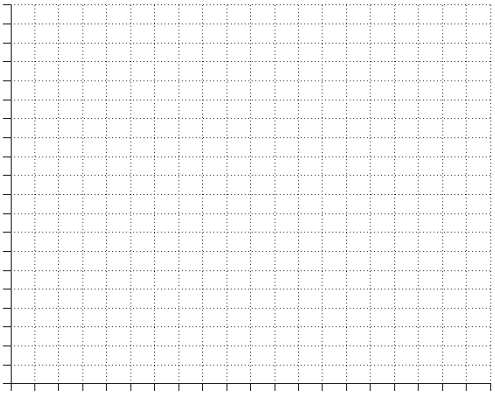


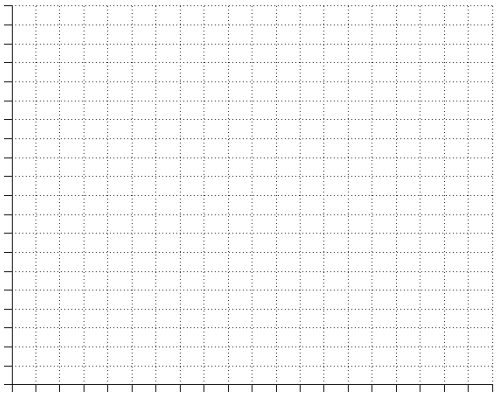


Example 2:

How do we convert a graph like $y = a\sqrt{bx}$ to the y = mx + b form? What does the slope mean?

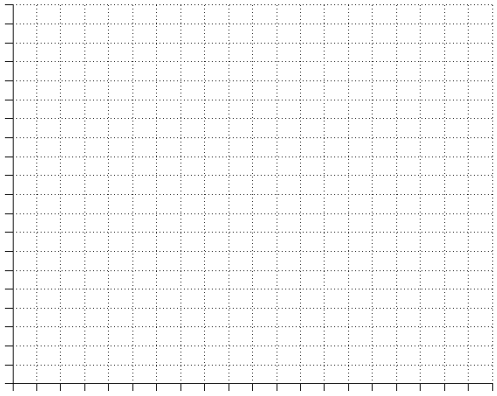
x		y
1		3.46
2		4.90
3		6
4		6.93
5		7.75
6		8.49

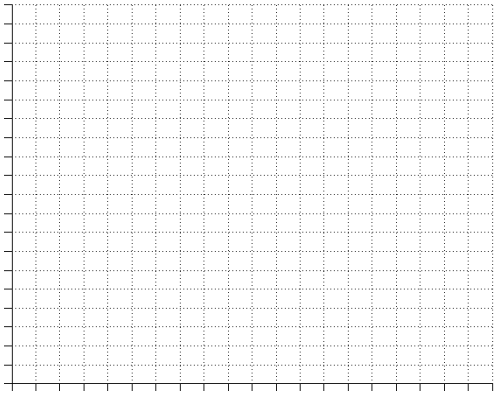




Draw the graph for the following data and linearize the 2nd graph. What model fits your data set the best?

x		y
1		2
2		1
3		2/3
4		½
5		2/5
6		1/3





Extra practice: Find the best fit slope of the linearized graphs above.