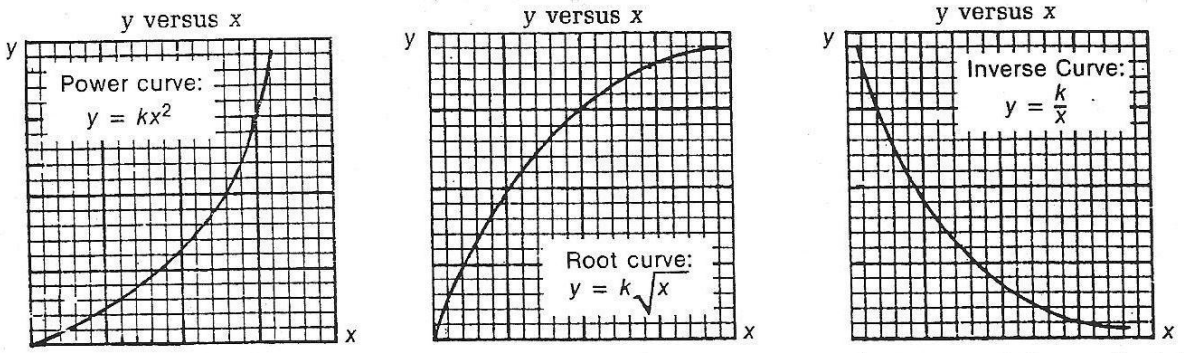
Honors Physics Mr. McMullen

Name _____ Date _____ Period_____

When the curve of the graph is not a straight line, you will need to identify the type of curve. Often it will fit into the catagories of root curves, power curves, or inverse curves.



To verify which of these curves you have, the data are systematically manipulated until the graph of the data yields a straight line. The equation for the straight line can be written and you will have obtained the relationship between the variables.

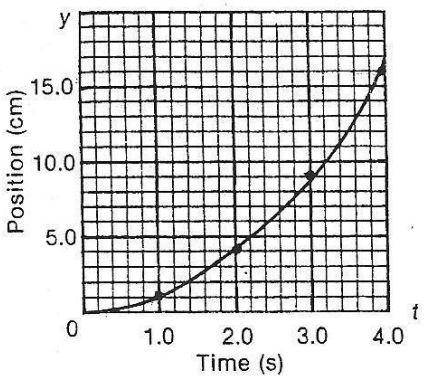
If your graph looks like a power curve, you would expect the equation to be

$$y = kx^2$$

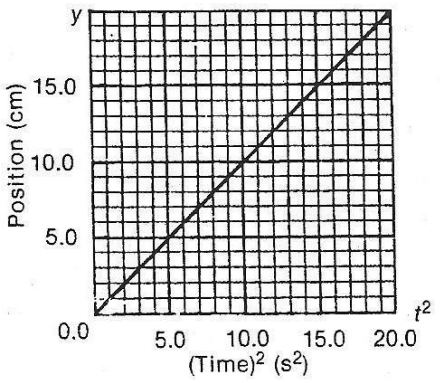
To see if you can "straighten" the curve, calculate values of x^2 and plot y versus x^2. A simple example is given below. Columns y and t are the experimental data. Column t^2 contains the manipulated data. As you can see, the graph of y versus t^2 is a straight line and has a slope of 1.0 m/s^2. The equation of the line is $y = (1\ m/s^2)\ t^2$.

y (cm)	t (s)	t^2 (s^2)
0.0	0.0	0.0
1.0	1.0	1.0
4.0	2.0	4.0
9.0	3.0	9.0
16	4.0	16

Position versus Time



Position versus (Time)^2



If your graph looks like a root curve, your general equation would be

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

To straighten the curve plot y versus $\sqrt{x}$. For an inverse relationship

$$y = k/x$$

you would plot y versus $1/x$. If these do not straighten your curve, you are dealing with a more complex relationship.