Name:_____ Date:_____

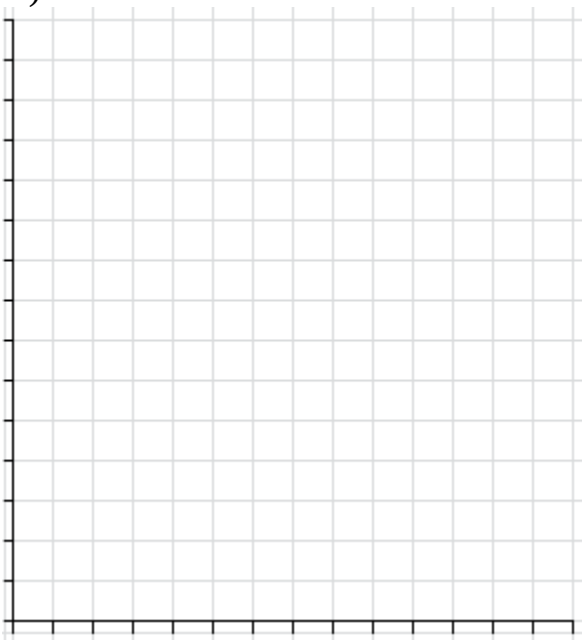
EXTRA CREDIT: Visualizing Galileo's Gravity Experiments

Galileo Galilei (1564– 1642) spent a good deal of time rolling balls down inclined planes, carefully recording the distance they traveled as a function of elapsed time. His experiments are commonly repeated in physics classes today, so it is easy to reproduce a typical table of Galilean data.

Elapsed time (seconds)	0	1	2	3	4	5	6	7	8
Distance traveled (inches)	0	0.75	3	6.75	12	18.75	27	36.75	48

A) What graphical model fits the data? B) Can you find an algebraic model that fits? C) How do you know the algebraic model you derived is the best one? D) Based on your algebraic model how far will the ball have traveled at 30 seconds (assume no frictional resistance)?

A)



B)

_____

C)

_____

D)

_____

This insight led Galileo to discover several basic laws of motion that would eventually be named after Isaac Newton. While Galileo had found the algebraic model to describe the path of the ball, it would take Newton's calculus to explain why it worked.

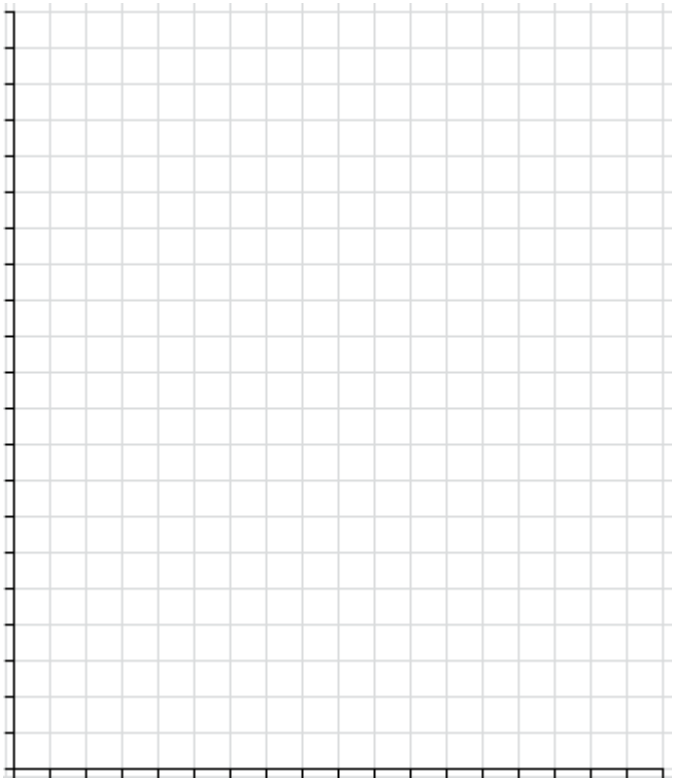
Name:_____ Date:_____

Hourly Earnings of U. S. Production Workers

The average hourly earnings of U. S. production workers for 1990– 2007 are shown in Table 1.13.

Table 1.13 Average Hourly Earnings

Year	Average Hourly Earnings ($)
1990	10.20
1991	10.52
1992	10.77
1993	11.05
1994	11.34
1995	11.65
1996	12.04
1997	12.51
1998	13.01
1999	13.49
2000	14.02
2001	14.54
2002	14.97
2003	15.37
2004	15.69
2005	16.13
2006	16.76
2007	17.42



A) Produce a scatter plot of the hourly earnings (y) as a function of years since 1990 (x).

B) Find the linear regression equation. Round the coefficients to the nearest 0.001.

C) Does the value of r suggest that the model is appropriate?

D) Find the quadratic regression equation. Round the coefficients to the nearest 0.001.

E) Does the value of r^2 suggest that the model is appropriate?