Date _____ Period _____ Name _____

CHAPTER 1

Enrichment

Materials

- graph paper
- ruler
- calculator

Graphing Nonlinear Relationships

Seventeenth-century physicist Galileo looked for an equation to compute the distance traveled by a falling object. He created a mathematical expression relating distance (d), the gravitational attraction of Earth near its surface (g), and time (t):

$$d = \frac{1}{2}gt^2.$$

At Earth's surface, g is a constant measuring 9.80 m/s^2.

Procedure

Use Galileo's equation to create a table quantifying the distance a falling object travels every second for 10 seconds.

Time (s)	Distance (m)
0	0
1	4.9m
2	19.6
3	44.1
4	78.4
5	122.5
6	176.4
7	240.1
8	313.6
9	396.9
10	490

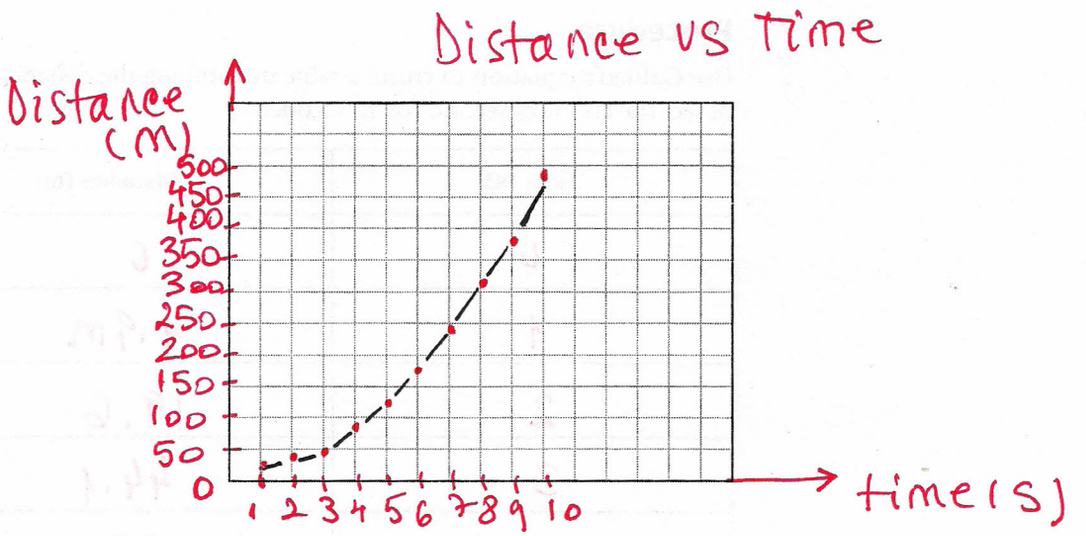
Results

1. What is the independent variable in Galileo's equation? What is the dependent variable? Explain your answer.

Independent Variable = time

Dependent Variable = distance

2. Graph the results from the table on the previous page.



3. What shape is the line of best fit on your graph? Why?

parabola = shape of graph

Quadratic Relationship