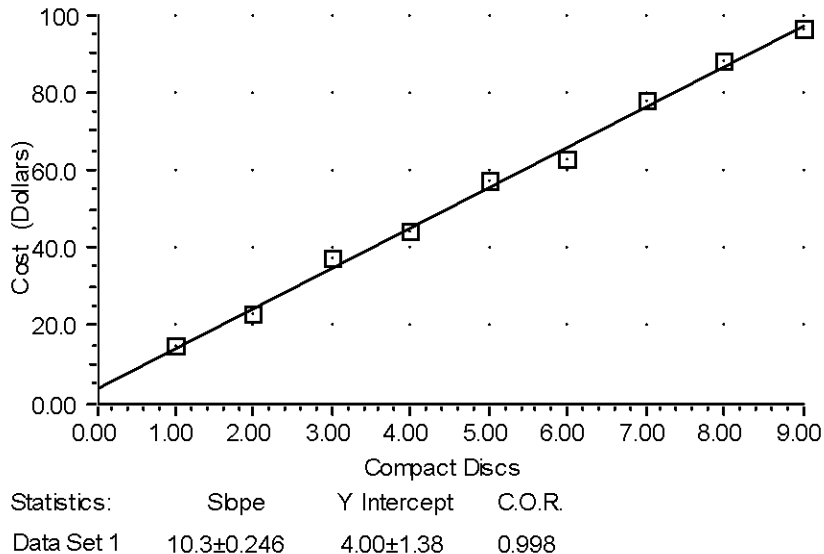# Unit 1 Review: Scientific Methods

1. The following data are based on charges for membership in a CD purchasing club.


Statistics:	Slope	Y Intercept	C.O.R.
Data Set 1	10.3±0.246	4.00±1.38	0.998

a. What are the units of slope for this graph?

b. What is the average price of a compact disc?

c. What is the mathematical equation that states the relationship described by the graph?

2. The following data were collected during an experiment:

	Time (s)			
Mass (kg)	**Trial 1**	**Trial 2**	**Trial 3**	**Trial 4**
5	10.2	9.5	10.5	10.3
10	15.3	15.6	15.2	15.4
15	23.4	24.5	23.8	23.1
20	35.0	35.8	35.2	35.4

a. Express the average time for each mass, using the correct number of significant figures.

b. Write a clear, English sentence that describes a general relationship between mass and time.

3. The graph below shows the relationship between scores on the SAT exam and the number of years students study science.
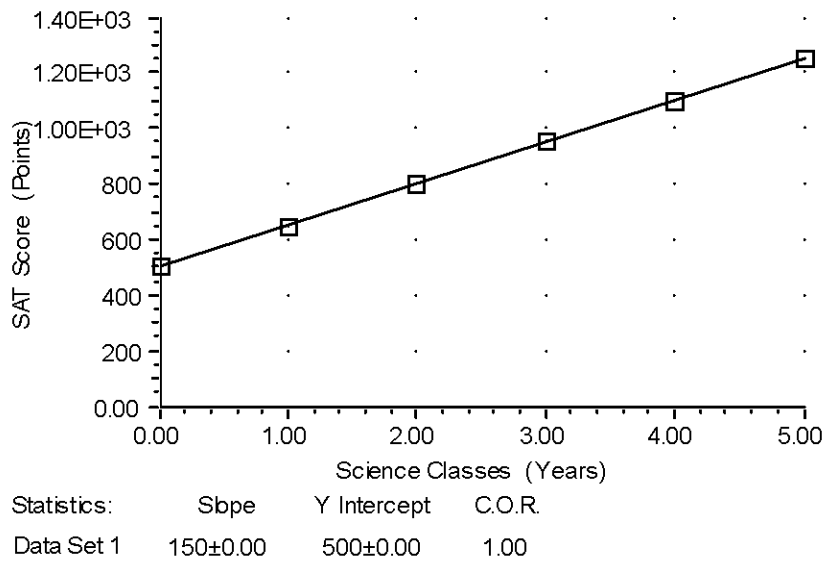
Statistics:	Slope	Y Intercept	C.O.R.
Data Set 1	150±0.00	500±0.00	1.00

a. What is the mathematical equation that states the relationship described by the graph?

b. Write a clear, English sentence that describes the meaning of the slope.

c. What would be the SAT score of a student who took seven science classes?

4. A student performed an experiment with a metal sphere. The student shot the sphere from a slingshot and measured its maximum height. Six different trials were performed with the sphere being shot at a different angle from the horizontal for each trial.

a. What is the relationship being studied?

b. What is the independent variable in this experiment?

c. What is the dependent variable in this experiment?

d. What variable must be held constant throughout this experiment?

5.   Describe the relationships that we proved in our pendulum lab. The variables included were period, mass, amplitude, and length. **Use complete, English sentences to describe the relationships!!**

6.
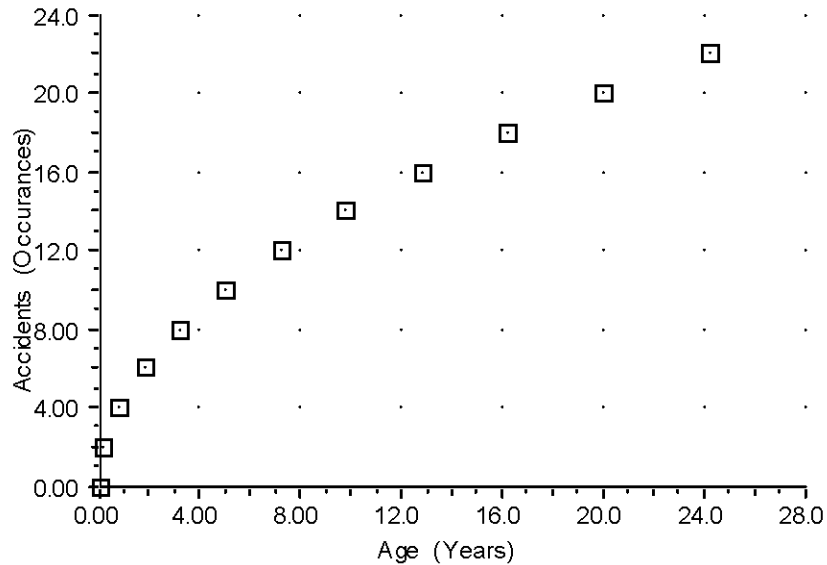
a. What type of relationship does this graph suggest?

b. What variables would you plot to linearize the data?

7. Below is a graph of the relationship between scholarship awards and the effort students exerted trying to win scholarships.
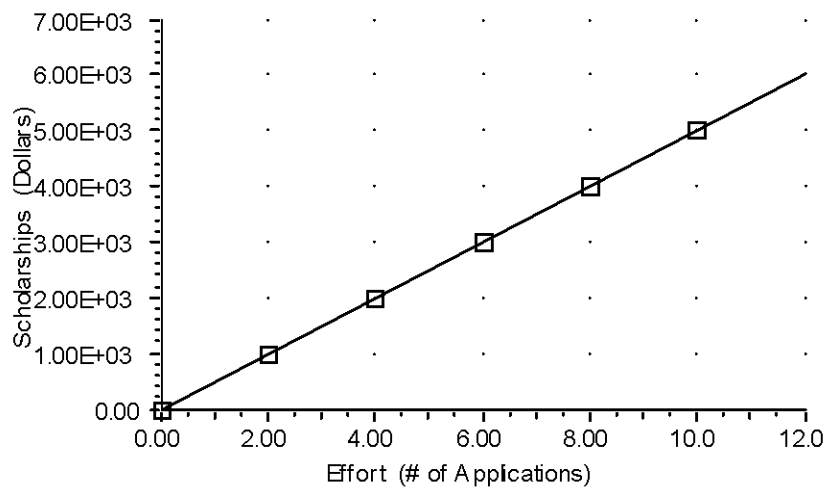
Statistics:	Slope	Y Intercept	C.O.R.
Data Set 1	500±0.00	0.00±0.00	1.00

a. Write the mathematical equation that states the relationship described by the graph.

b. What does the y-intercept illustrate?

c. Using the mathematical model, how many applications would be needed to earn $8000?

8. For each of the following relationships:
    • Write what method should be used to linearize the data.
    • Write the mathematical equation that would describe the straight line produced.
    • Draw a graph which visually represents the relationship.

    a. Hyperbolic (Inverse)

    b. Top Opening Parabola

    c. Side Opening Parabola