Name: KEY Pd: ____

Skill Building WS 1

For each description below, identify what type of relationship exists.

1. As the temperature outside goes up, the number of sweater sales goes down.

   Inverse

2. As money is invested into a compounding interest savings account, the account value increases exponentially.

   Quadratic

3. As a waitress gets paid based on the amount of hours that they work.

   Linear

4. The mass of a neon sign stays the same as its color changes.

   Horizontal

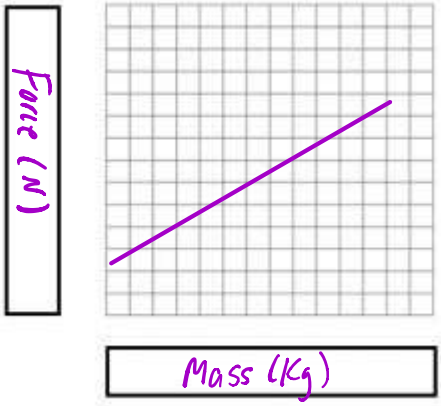
Enter each of the sets of data on the next page into SparkVUE to create a graph demonstrating a certain type of relationship between the variables listed. The independent variable is the one listed in the column on the left. The dependent variable is the one listed in the column on the right. In your mathematical model, include proper units on numbers and variables. Do not use x and y to represent your variables, use more applicable symbols.

Graph Drawings	Analysis Questions

1.

Mass (kg)	*Force (Newtons)*
1.0	5.6
2.0	9.0
3.0	12.6
4.0	15.9
5.0	19.5

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Linear

B) Describe the relationship between these two variables in words.

As mass increases, force also increases by the same amount.

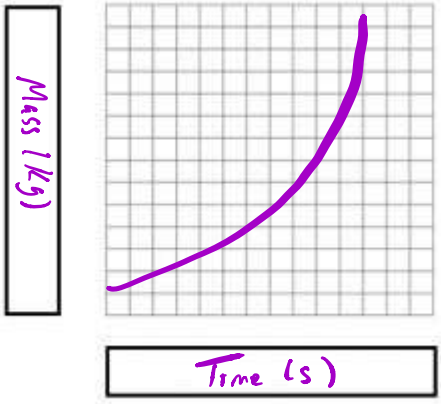
C) What was the final mathematical model (a.k.a. equation) produced by this data?

$F = (3.47\ N/kg)m + 2.11\ N$

2.

Time (seconds)	*Mass (kg)*
1.01	4.2
1.52	9.6
2.42	23.8
3.03	38.0
4.55	85.1

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Quadratic

B) Describe the relationship between these two variables in words.

As time increases, the mass increases more and more.

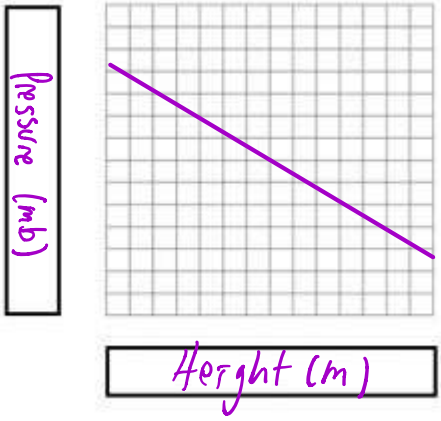
C) What was the final mathematical model (a.k.a. equation) produced by this data?

$M = (4.11\ \frac{kg}{s^2})t^2 + 0.0089\ kg$

3.

Height (meters)	*Pressure (mb)*
100	989
200	897
300	794
400	699
500	600

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Linear

B) Describe the relationship between these two variables in words.

As height increases, Pressure decreases by the same amount

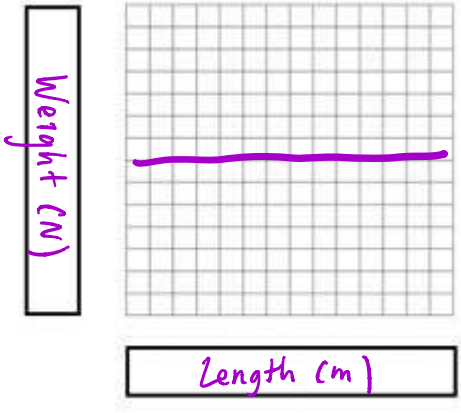
C) What was the final mathematical model (a.k.a. equation) produced by this data?

$P = \left(-0.976 \frac{mb}{m}\right) h + 1090\ mb$

4.

Length (m)	*Weight (N)*
1.0	52.4
2.5	53.6
5.0	52.4
10.0	54.0
20.0	52.6

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Horizontal

B) Describe the relationship between these two variables in words.

As length increases, weight stays the same

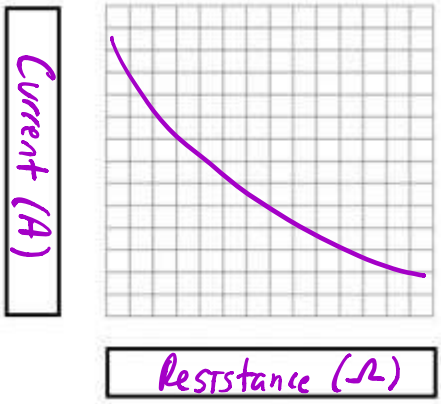
C) What was the final mathematical model (a.k.a. equation) produced by this data?

$W = 53\ N$

5.

Resistance (Ohms)	*Current (Amperes)*
100	1.23
200	0.63
300	0.37
400	0.29
800	0.15

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Inverse

B) Describe the relationship between these two variables in words.

As resistance increases, current decreases.

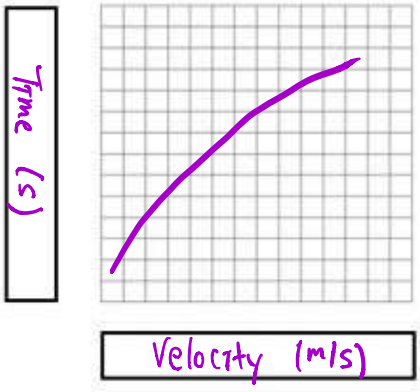
C) What was the final mathematical model (a.k.a. equation) produced by this data?

$$\text{Current} = \frac{(125\ \text{A}\cdot\Omega)}{\text{resistance}}$$

6. * can be interpreted as either ↳

Velocity (m/s)	*Time (s)*
5	4.01
10	5.71
15	6.95
20	8.08
25	8.65

***For graphs, include shapes only. No numbers!**



A) What type of relationship does this data produce?

Quadratic
or
Linear

B) Describe the relationship between these two variables in words.

As velocity increased, time increases by less and less
As velocity increased, time increases by the same amount

C) What was the final mathematical model (a.k.a. equation) produced by this data?

$$t = \left(-0.00677\ \frac{s}{(m/s)^2}\right) v^2 + 2\ s$$

$$t = \left(0.233\ \frac{s}{m/s}\right) v + 3.18 s$$