

Lesson Summary

- A line can be used to represent the trend in a scatter plot.
- Evaluating the equation of the line for a value of the independent variable will determine a value predicted by the line.
- A good line for prediction is one that goes through the middle of the points in a scatter plot and for which the points tend to fall close to the line.

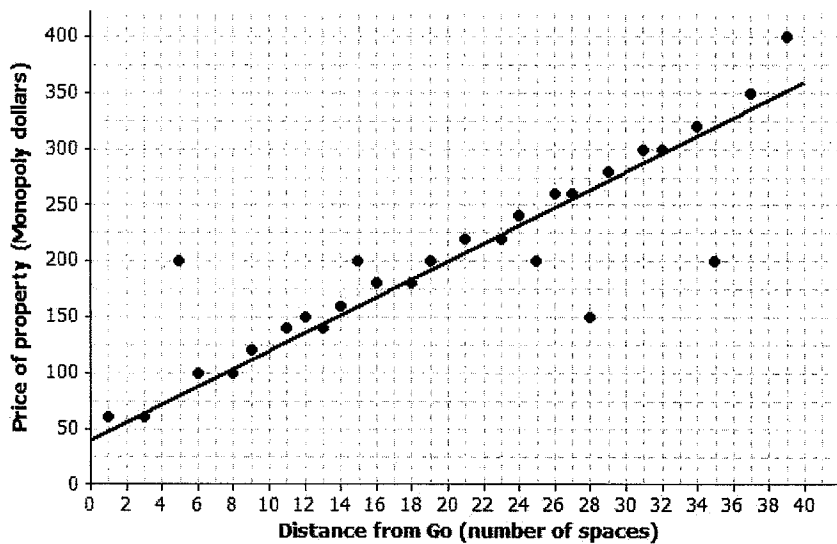
Problem Set

1. Monopoly is a board game that is popular in many countries. The scatter plot below shows the distance from “Go” to a property (in number of spaces moving from “Go” in a clockwise direction) and the price of the properties on the Monopoly board. The equation of the line is $P = 8x + 40$, where P represents the price (in Monopoly dollars) and x represents the distance (in number of spaces).

Distance from “Go” (number of spaces)	Price of Property (Monopoly dollars)
1	60
3	60
5	200
6	100
8	100
9	120
11	140
12	150
13	140
14	160
15	200
16	180
18	180
19	200

Distance from “Go” (number of spaces)	Price of Property (Monopoly dollars)
21	220
23	220
24	240
25	200
26	260
27	260
28	150
29	280
31	300
32	300
34	320
35	200
37	350
39	400

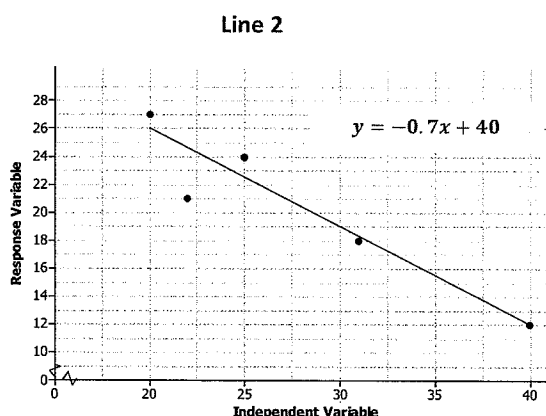
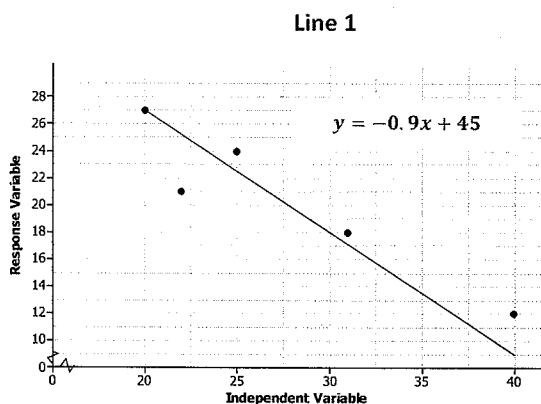
Price of Property vs. Distance from "Go" in Monopoly



- Use the equation to find the difference (observed value – predicted value) for the most expensive property and for the property that is 35 spaces from "Go."
- Four of the points seem to lie in a horizontal line. What do these points have in common? What is the equation of the line containing those four points?
- The four points described in part (b) are the railroads. If you were fitting a line to predict price with distance from "Go," would you use those four points? Why or why not?

2. The table below gives the coordinates of the five points shown in the scatter plots that follow. The scatter plots show two different lines.

Data Point	Independent Variable	Response Variable
A	20	27
B	22	21
C	25	24
D	31	18
E	40	12



- a. Find the predicted response values for each of the two lines.

Independent	Observed Response	Response Predicted by Line 1	Response Predicted by Line 2

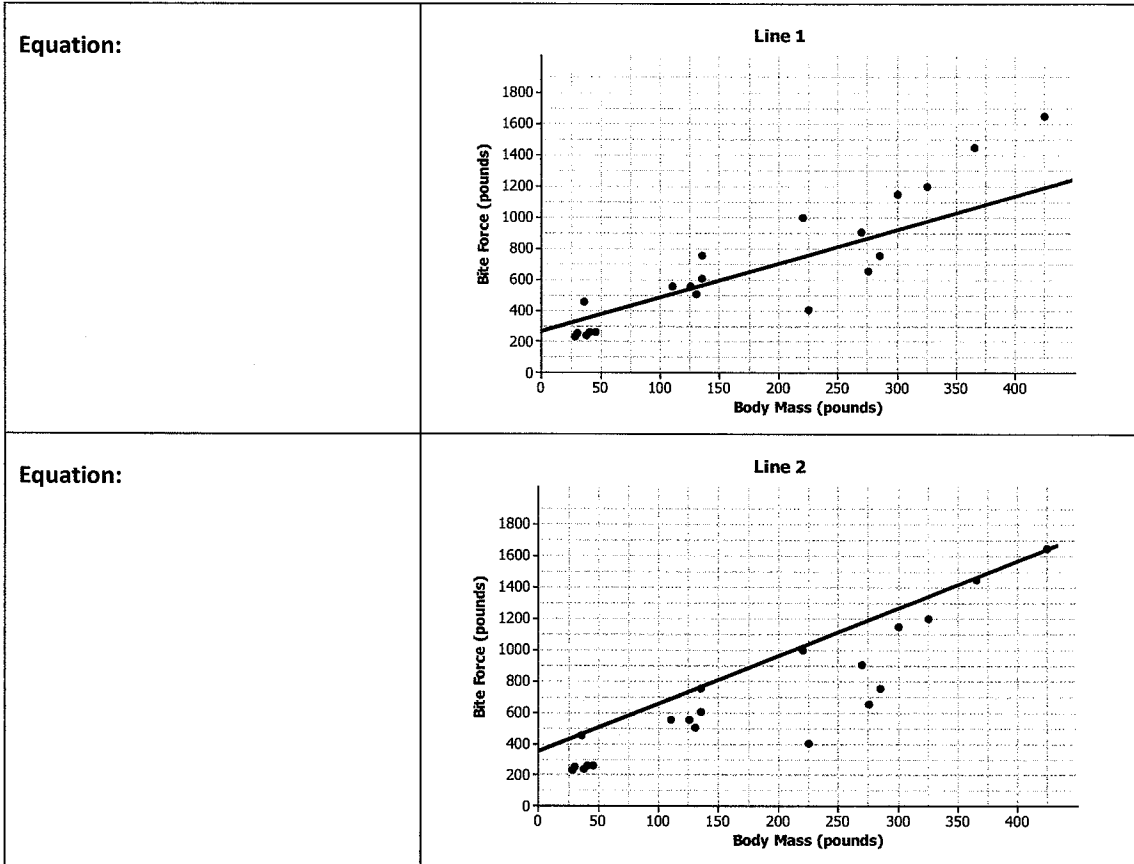
- b. For which data points is the prediction based on Line 1 closer to the actual value than the prediction based on Line 2?
- c. Which line (Line 1 or Line 2) would you select as a better fit?

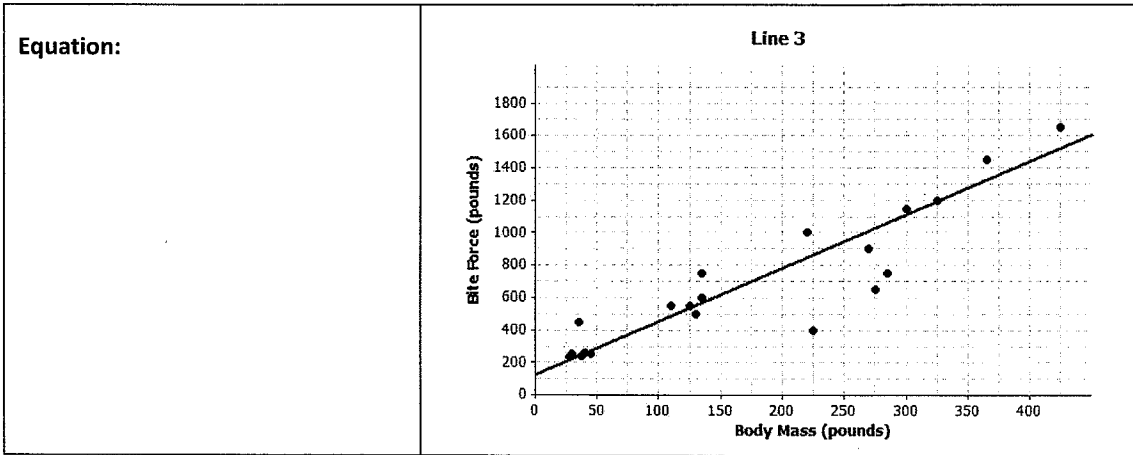
3. The scatter plots below show different lines that students used to model the relationship between body mass (in pounds) and bite force (in pounds) for crocodiles.
- a. Match each graph to one of the equations below and explain your reasoning. Let B represent bite force (in pounds) and W represent body mass (in pounds).

Equation 1
 $B = 3.28W + 126$

Equation 2
 $B = 3.04W + 351$

Equation 3
 $B = 2.16W + 267$





- b. Which of the lines do you think would be a better fit for the trend in the data? Explain your thinking.
4. Comment on the following statements:
- A line modeling a trend in a scatter plot always goes through the origin.
 - If the response variable increases as the independent variable decreases, the slope of a line modeling the trend will be negative.