**Unit 4, Module 12:** Fitting a Line

1. A regression analysis of the initial drop (in feet) of a roller coaster ride and the duration of the ride (in seconds) yields the model: , where *Duration* is the response variable and *Drop* is the explanatory variable.
   1. Explain what the slope of the line says about how long a roller coaster ride may last and the height of the coaster.
   2. Explain what the y-intercept of the line means in this situation. Does this make sense for roller coasters in “real life”?
   3. A new roller coaster advertises an initial drop of 200 feet. How long would you predict the ride lasts?
   4. Another coaster with a 150-foot initial drop advertises a 2 minute ride. Is this longer or shorter than you’d expect? By how much? What did you just calculate?
2. Chicken sandwiches are often advertised as a healthier alternative to beef because many are lower in fat. Tests of 11 brands of fast food chicken sandwiches produced the following summary statistics and scatterplot from a graphing calculator:

|  |  |  |
| --- | --- | --- |
|  | x | y |
|  | Fat (g) | Calories |
| Mean | 20.6 | 47.2 |
| St. Dev. | 9.8 | 144.2 |
| Correlation | 0.947 | |

* 1. Do you think a linear model is appropriate in this situation? Explain.
  2. Describe the strength of this association.
  3. Write the equation of the regression line.
  4. Explain the meaning of the slope.
  5. Explain the meaning of the y-intercept.
  6. If a chicken sandwich and a burger each advertise 35 grams of fat, which would you expect to have more calories? Calculate the expected number of calories for the chicken sandwich using your regression line and compare it to the expected number of calories if the regression line for burgers is given by: . (Turns out the correlation between calories and fat for burgers is 0.96)