Math 200

Mod 7 Example

The graph below shows a scatter plot associating the distance students in our class live from Skyline and the time it takes them to travel to school.

|  |  |
| --- | --- |
|  | **Notice that the intercept is the point (0, 10.02) and it means that a person who lives 0 miles from Skyline (lives at Skyline!) takes 10.02 minutes to get to Skyline. This is another example of extrapolation.** |

The statistics relating the associated variables are shown to the right of the graph.

1. Without looking, estimate the correlation coefficient (*r*) for these data: ***r =* 0.7**
2. Identify the explanatory variable: **Distance (from Skyline)**
3. Round decimals to two places and rewrite the regression formula relating these data:

  **Time = 10.02 + 1.28 • Distance**

1. Use the equation from #3 to predict the travel time for someone who lives 9.5 miles from Skyline.

**Time = 10.02 + 1.28 • 9.5**

 **= 22 minutes**

1. Use the equation from #3 to predict the travel time for someone who lives 100 miles from Skyline.

**Time = 10.02 + 1.28 • 100**

 **= 138 minutes**

1. Why is the answer to #5 an inappropriate application of the regression equation?

**The answer to #5 is an example of extrapolation. It assumes the trend in our data continues indefinitely – beyond the values in the data set.**

**This is an unreasonable assumption since there are no data to support the assumption that the pattern in the data goes on without change.**

1. Do there appear to be any outliers? If so, which? If not, why not?

**Yes – at 60 miles (at the point (60, 90) and at 90 minutes (at the point (11, 90)).**

1. What is the slope of the line and what does it mean in this context? (Be sure to include units and numbers in your explanation).

**The slope is 1.28.**

**The units of the slope are from response/explanatory: minutes/mile**

**This tells us that for each additional mile a person lives from Skyline, we expect their commute time to increase by 1.28 minutes.**

1. What is the *r*2 value and what does it tell us about the regression line and these data?

***r*2 = 0.5. This means that 50% of the variability in the Time it takes to get to Skyline is explained by the linear relationship with the Distance someone lives from Skyline.**