

MTH 3210 Lab 5 Answer Sheet

Due Thu., May 9

1 Part A

1.1 Yellowstone Lake Data Set

1. NA
2. NA
3. NA
4. *Don't* print the scatterplot. Just use the plot to answer the following question.
Describe the relationship between the lake's **outflow** and its **elevation** (Positive or Negative? Linear or Curved? Strong, Moderate, or Weak?).
5. Give the value of the correlation: $r =$ _____

2 Part B

2.1 Yellowstone Lake Data Set (Continued)

1. NA (*don't* print the plot)
2. NA
3. Give the following values and then answer the questions:

The y -intercept of the fitted regression line is $b_0 =$ _____

The slope of the fitted line is $b_1 =$ _____

Based on the slope of the fitted regression line, does there appear to be an increasing trend in **outflow**? By how much did the **outflow** increase **per year**, on average, over the years 1926-2001?

4. *Don't* print the time-series plot. Just use the plot to answer the following question.
Use the fitted regression line to describe the trend in the lake's **outflow** (Increasing or Decreasing?) _____

3 Part C

3.1 Francis Galton's Heights Data

1. NA
2. NA
3. NA
4. *Don't* print the scatterplot. Just use the plot to answer the following question.
Describe the relationship between a **son's height** and his **father's height** (Positive or Negative? Linear or Curved? Strong, Moderate, or Weak?).
5. Give the value of the correlation: $r =$ _____
6. Give the **equation** of the fitted regression line.

Now use the equation to **predict** the **height** of a **son** whose **father** is **77** inches tall.

Predicted **height** of **son** whose **father** is **77** inches is $\hat{Y} =$ _____

Now use the equation to the **height** of a **son** whose **father** is **63** inches tall.

Predicted **height** of **son** whose **father** is **63** inches is $\hat{Y} =$ _____

7. Give the values of the two statistics and then answer the related questions:

The square root of the mean squared error is $s =$ _____

The R-squared value is $r^2 =$ _____

How large is a typical residual (deviation of son's height above or below the line)?

What are the units of measure for s ?

What proportion of the total variation in sons' heights is explained by the father's height?