Question 1. We want to predict water evaporation from humidity of the air. Here is a plot of the integrated humidity (Avh) versus evaporation (Evap) measured over 46 days.

(a.) Describe what you think the mean and variance functions look like and draw your guess at the mean function and ± sd bands (5 points)

(b.) Assuming these figures were collected over 46 randomly chosen summer days, do you think it believable that the data might follow a bivariate normal distribution? Why or why not? (4 points)
Question 2.

The summary statistics for this data set were

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Average</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avh</td>
<td>46</td>
<td>396.91</td>
<td>29.48</td>
<td>345.</td>
<td>392.</td>
<td>478.</td>
</tr>
<tr>
<td>Evap</td>
<td>46</td>
<td>34.674</td>
<td>14.638</td>
<td>1.</td>
<td>41.</td>
<td>54.</td>
</tr>
</tbody>
</table>

Data set = Evaporation, Sample Correlations

| Avh   | 1.0000 | -0.8255 |
| Evap  | -0.8255 | 1.0000  |
| Avh   |        |         |
| Evap  |        |         |

Regardless of your answer to question 1 part b, treat these numbers as if they were bivariate normal and answer these questions;

(a.) Using these sample statistics as estimates of the bivariate normal parameters, what do you estimate is the conditional distribution of Evap on a day where Avh=450? (4 points)

(b.) Why does it make sense to predict evaporation from humidity? And can you think of a reason why you might want to predict humidity from evaporation? (3 points)
Question 3.
Here is Arc output got from fitting the regression of Evap on Avh

Response  = Evap
Terms     = (Avh)
Coefficient Estimates
Label      Estimate        Std. Error    t-value    p-value
Constant   197.369         16.8138        11.739     0.0000
Avh       -0.409902        0.0422475      -9.702     0.0000

(a.) What does the ‘constant estimate’ tell you? (2 points)

(b) Use this output to set up a 95% confidence interval for the true slope of the line. You can use the value 2.02 for the necessary 95% $t$ critical value. (3 points)

(c) I followed up the fitting with this prediction request. Use it to set up 95% confidence interval for the true mean evaporation when the humidity is 450, and a 95% prediction interval for the humidity you would get on a summer day when the humidity was 450. (4 points)