There has been a lot of discussion regarding the relationship between Scholastic Aptitude Test (SAT) scores and test-takers’ family income (*New York Times*, August 27, 2009). It is generally believed that the wealthier a student’s family, the higher the SAT score. Another commonly used predictor for SAT scores is the student’s grade point average (GPA). Consider the data collected on 24 students.

1. Estimate 3 models and write the regression equations **(Round your answers to 4 decimal places.)**

|  |  |  |
| --- | --- | --- |
| MODEL 1 |  |  |
| MODEL 2 |  |  |
| MODEL 3 |  |  |

1. Conduct individual hypothesis tests to determine if the coefficients differ from zero.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Hypotheses | Coefficient Estimate (include sign) | P-value | Is the corresponding variable significant in explaining the variation in y? |
| MODEL 1  **Variable:** Income |  |  |  |  |
| MODEL 2  **Variable:** GPA |  |  |  |  |
| MODEL 3  **Variable:** Income |  |  |  |  |
| MODEL 3  **Variable:**  GPA |  |  |  |  |

1. Summarize the 3 models in the table below

|  |  |  |  |
| --- | --- | --- | --- |
|  | MODEL 1 | MODEL 2 | MODEL 3 |
| Multiple R |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Standard Error of the Estimate |  |  |  |

1. Which model is more appropriate for making predictions? Explain the comparisons you made to determine the best-fitting model.
2. In terms of the data, interpret the Coefficient of Determination for the model you chose.
3. In terms of the data, interpret the slope(s) of the line of best fit.
4. Use the best-fitting model to predict SAT given the mean value of the explanatory variable(s). The mean income is $72,833.33 and the mean GPA is 3.2783. **(Round intermediate calculations to 4 decimal places and final answer to 2 decimal places.)**