Problem 1: Twenty-six observations

1. Suppose *Y* is related to *R* and *S* in the following nonlinear way: *Y* *aR*b*S*c
2. In order to estimate the parameters *a*, *b*, and *c*, the equation must be transformed into the form: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Twenty-six observations are used to obtain the following regression results:**

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| DEPENDENT VARIABLE: LNY R-SQUARE F-RATIO P-VALUE ON F |
|  OBSERVATIONS: 26 0.3647 4.21 0.0170 |
|  VARIABLE PARAMETER STANDARD T-RATIO P-VALUE |
|  ESTIMATE ERROR |
|  |
|  INTERCEPT 2.9957 0.3545 8.45 0.0001 |
|  LNR 2.34 0.87 2.69 0.0134 |
|  LNS –0.687 0.334 –2.06 0.0517  |

1. There are \_\_\_\_\_\_\_\_\_\_ degrees of freedom for the *t*-test. At the 1% level of significance, the critical *t*-value for the test is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. At the 1% level of significance, *a*ˆ \_\_\_\_\_\_\_\_\_\_\_\_ (is, is not) significant, *b*ˆ \_\_\_\_\_\_\_\_\_\_ (is, is not) significant, and ˆ *c* \_\_\_\_\_\_\_\_\_\_\_ (is, is not) significant.
3. The estimated value of *a* is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The *p*-value for *b*ˆ indicates that the exact level of significance is \_\_\_\_\_\_\_ percent, which is the probability of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. At the 1% level of significance, the critical value of the *F*-statistic is \_\_\_\_\_\_\_\_\_. The model as a whole \_\_\_\_\_\_\_\_\_\_\_ (is, is not) significant at the 1% level.
6. If *R* = 12 and *S* = 30, the fitted (or predicted) value of *Y* is \_\_\_\_\_\_\_\_\_\_\_\_\_.
7. The percentage of the total variation in the dependent variable *not* explained by the regression is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ percent.
8. If *R* increases by 14%, *Y* will increase by \_\_\_\_\_\_\_\_ percent.
9. A 6.87% increase in *Y* will occur if *S* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (increases, de\creases) by \_\_\_\_\_\_\_ percent.