SKILLS Objective B

1. The Tribonacci numbers are defined by \( T(1) = 0, \ T(2) = 1, \ T(3) = 1, \) and succeeding values are found by adding the previous three. The first 10 Tribonacci numbers are in the following table.

\[
\begin{array}{cccccccccc}
 n & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 \\
 T(n) & 0 & 1 & 1 & 2 & 4 & 7 & 13 & 24 & 44 & 81 \\
\end{array}
\]

A linear model for the first 10 Tribonacci numbers is \( T(n) = 7.2n - 22. \) Compute the residual for

a. \( T(1). \)  

b. \( T(3). \)  

c. \( T(6). \)  

d. \( T(9). \)

2. A situation is modeled by the equation \( f(x) = 4.2x - 5.7. \) Residuals for certain values for \( x \) are given at the right. What are the observed values?

<table>
<thead>
<tr>
<th>( x )</th>
<th>Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>-0.4</td>
</tr>
<tr>
<td>2.5</td>
<td>1.2</td>
</tr>
<tr>
<td>9.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

PROPERTIES Objective D

3. Refer to Question 1.

a. What does the model predict for the 10th Tribonacci number? __________________

b. Interpret the slope of the line in the linear model. __________________

c. Why is the model not good for predicting the 10th Tribonacci number? __________________

USES Objective F

4. At the right is a scatterplot of the prices of selected 2008 vehicles and their estimated city mpg.

a. Use the identified data points to find an equation for a line to fit the data. __________________

b. What does a negative slope of the line mean in this context? __________________

c. If a vehicle cost $32,000, how many city mpgs are expected? __________________

d. What is the expected price of a vehicle that gets 19mpg? __________________
5. The monthly average high temperature for the first eight months of the year in San Diego can be modeled by \( y = 1.5x + 63 \). Refer to the graph at the right.

a. Calculate the residual values for the first eight months of the year.

b. Graphically represent and label the residual for the seventh month on the graph at the right.

c. Calculate the Error SS.

d. Graphically represent and label the Error SS on the graph at the right.

6. Refer to Question 4.

a. Explain why the value of the residual for \((93.3, 12)\) is equal to the value of the residual for \((18.1, 28)\).

b. One of the points on the scatterplot is \((26.0, 21)\). Calculate its residual.