Find That Sine

FindThatSine.tns

Name _____

Class _____
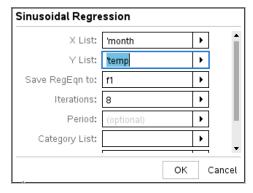
Problem 1 – Temperature

The temperature in Kansas City fluctuates from cold in the winter to hot in the summer. The average, monthly temperature (°F) has been entered into the spreadsheet on page 1.3.

Find the sine equation that models the data. Place the cursor on cell c1 and select **Sinusoidal Regression** from the Stat Calculations menu.

- What is the sinusoidal regression equation of the data? Use two-decimal accuracy.

On page 1.4, create a scatter plot for this data (**MENU > Graph Type > Scatter Plot**). Select **month** for the *x* and **temp** for *y*.

Graph the sine equation by changing the graph type to function and enabling **f1**(x).

- How well does the equation model the data? Explain.

Problem 2 – Hours of Sunlight

The amount of light a location on the Earth receives from the Sun changes each day depending upon the time of year and latitude of that location. The amount of daily sunshine Kansas City experiences is shown on page 2.3, where the calendar day is Column A and the hours of sunlight is Column B.

- What is the sinusoidal regression equation of the data?

On page 2.4, create the scatter plot and graph the sine equation that models the data.

- How well does the equation model the data? Explain.

Use the **Hide/Show** tool to hide the scatter plot and the displayed equation for **f1**(x).

In early cultures, certain days of the year had significant importance because of the planting cycle. These days were the winter and summer solstices and the spring and fall equinoxes. The equinoxes are the days with equal amounts of light and dark. The summer solstice has the greatest amount of sunlight, while the winter solstice has the fewest amount of sunlight.

- Find the four dates by creating a point on the graph (**MENU > Points & Lines > Point On**) and tracing it along the graph.

Problem 3 – Tides

The Bay of Fundy has the highest tides in the world. If a tape measure were attached at the water line of a peer and the water level height were recorded over a period of eighteen hours, data like that on page 3.6 would be generated.

- What is the sinusoidal regression equation of the data? Use two-decimal accuracy.

- How well does the equation model the data? Explain.

- Predict the water level when the time is 49 hours after the readings were started.

Additional Practice

The rabbit population in a field fluctuates with the seasons. In January, the cold weather and lack of food reduces the population to 500. In July, the population rises to its high of 800. This cycle repeats itself. Determine a model.