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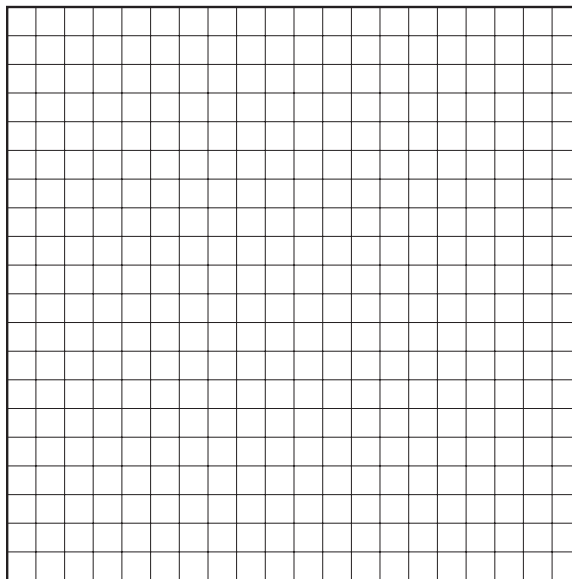
Practice: Sinusoidal Regression

B

The following table shows the temperature, in degrees Fahrenheit, in a small town during the day. The hours are given in 24-hour time. Use the table to complete problems 1–3.

Hour	Temperature (°F)
2	59
5	59
8	58
11	61
14	65
17	65
20	63
23	59

1. Create a scatter plot of the data.



2. Plot the function $y = 4 \sin(0.3x + 2.98) + 61$ on the scatter plot. Is it a good fit?
3. Estimate the temperature at midnight (hour 0).

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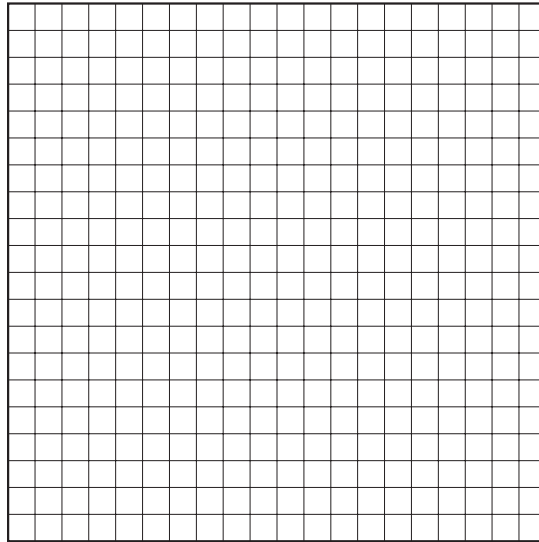
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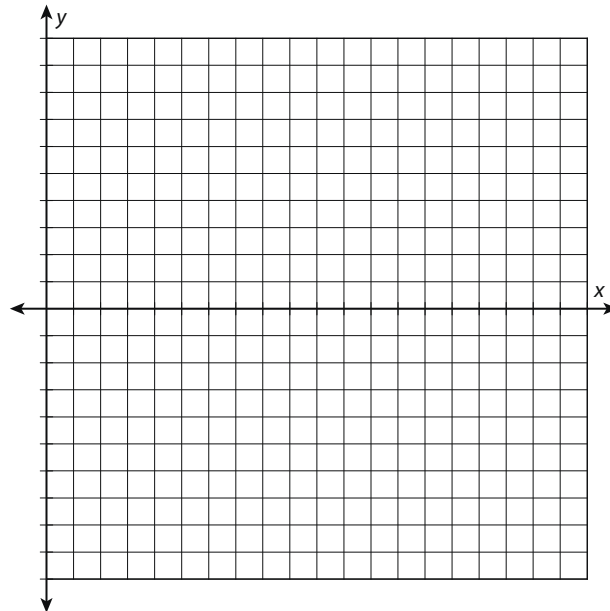
The following table shows the average monthly precipitation totals, in inches, for Austin, Texas. Use the table to complete problems 4–7.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Average precipitation (inches)	2.22	2.02	2.76	2.09	4.36	4.33	1.88	2.35	2.99	3.88	2.96	2.4

4. Create a scatter plot of the data.



5. Find a sinusoidal regression for the data.
6. Create a residual plot for the regression.



7. Is a sine function a good fit?

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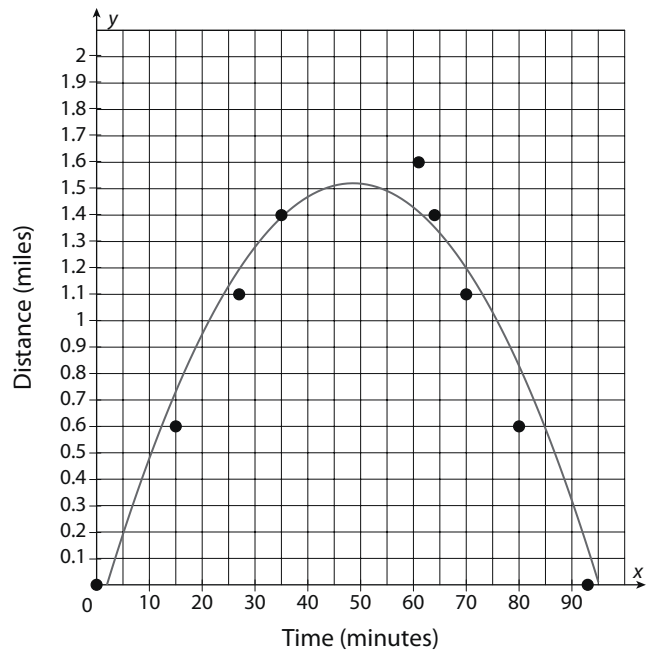
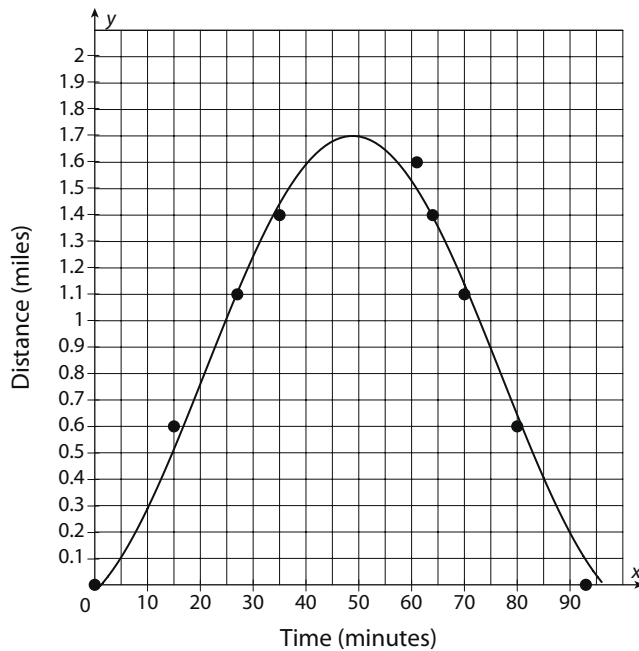
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Use the given data to complete problems 8–10.

Valery is trying to figure out her kayaking speed in a river. She records the time it takes to pass various landmarks, then later uses a digital mapping program to approximate the distances those landmarks are from her starting point. Her results are below.

Time (minutes)	Distance from launch (miles)
0	0
15	0.6
27	1.1
35	1.4
61	1.6
64	1.4
70	1.1
80	0.6
93	0

Valery came up with two functions to estimate her data. These are shown in the following graphs.

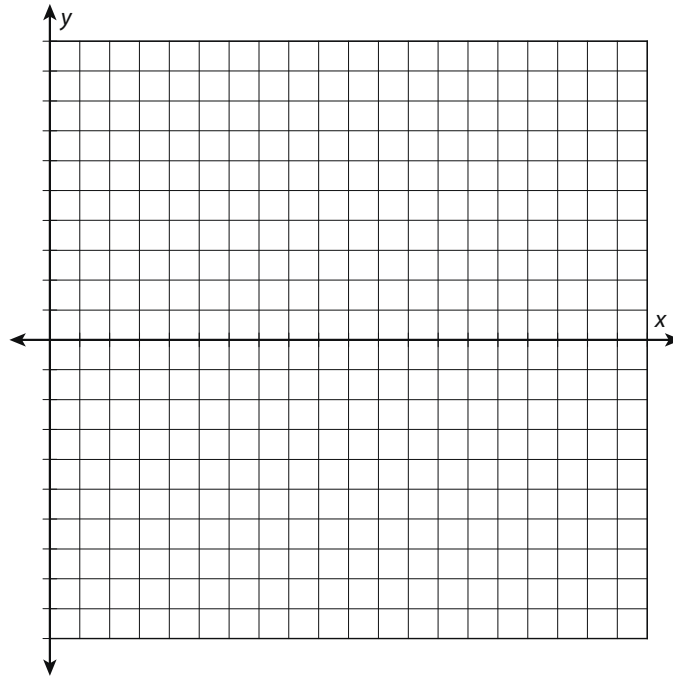


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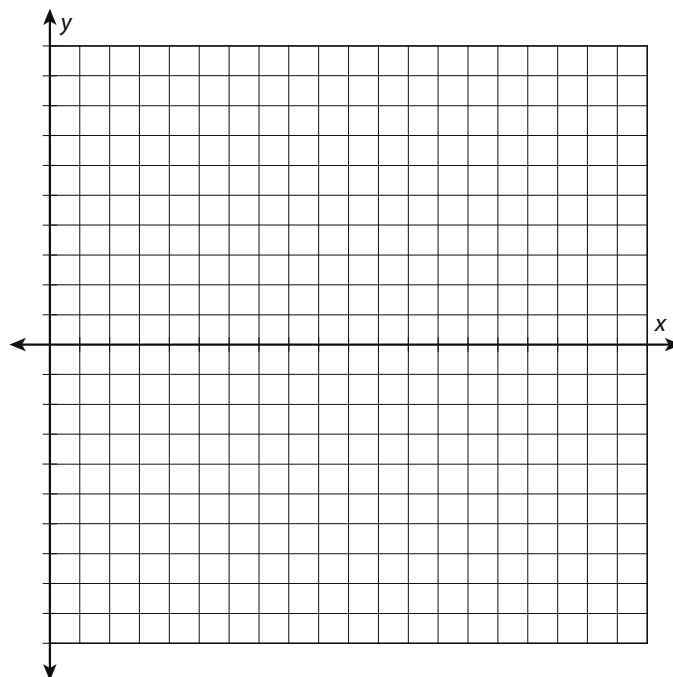
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8. Create a residual plot for the function $y = 0.9 \sin(0.056x - 1.164) + 0.8$. Is it a good fit?



9. Create a residual plot for the function $y = -0.0007x^2 + 0.068x - 0.1307$. Is it a good fit?



10. Which function is a better fit?