
The Chapter Problem—How Much Daylight?: Questions

Section 5.1

- CP1.** How can Naomi use the data in the table to schedule her guided fishing trips and maximize the possible catch within the fishing regulations on catch limits per day?
- CP2.** Explain why the data is periodic. What is the period of the data?
- CP3.** State the domain and range of the data.
- CP4.** (a) Graph average hours of daylight versus month. Refer to the start of the data as $t = 0$.
(b) What is the equation of the axis of the curve?
(c) What are the maximum and minimum values?
(d) What is the amplitude of the graph?

Section 5.2

- CP5.** Sketch the graph for all 25 months in the table.
- CP6.** Highlight one complete cycle for the graph that resembles a typical sine function. Highlight a cycle that resembles a typical cosine function.
- CP7.** What type of periodic function could be used to model the relationship between time in months and average monthly hours of daylight?

Section 5.4

- CP8.** Revisit your graph of the data for the two-year period in the table.
(a) Evaluate $f(3)$.
(b) Show that $f(3) = f(3 + 12)$ and explain why this should be true.
(c) Explain why there are other values that are about the same as $f(3)$.
- CP9.** (a) Approximate the average number of daylight hours for $f(30)$.
(b) Extend the graph to evaluate $f(-10)$.
(c) Which months correspond to $f(30)$ and $f(-10)$?

Section 5.6

- CP10.** Refer to the graph of the original data you made earlier.
(a) Explain how the axis of the graph and the concept of vertical shift are related. What does vertical shift mean in this problem?
(b) What choices of starting position are possible when highlighting a cycle? What is the phase shift if a typical sine function were highlighted? if a typical cosine function were highlighted? What does phase shift mean in this problem?
(c) Compare the period of this data to the period of $y = \sin \theta$ or $y = \cos \theta$. How can you use this information to find the equation representing the data?

Section 5.7

- CP11.** Write an equation in the form $y = a \sin k(\theta + b) + d$ to model the average number of hours of daylight for the Far North community.
- CP12.** Use a graphing calculator set to an appropriate scale to graph the equation. Confirm that the graph matches your graphs that you drew for previous sections.
- CP13.** How many hours of daylight should be expected at month 252?

Section 5.8

- CP14.** The equation $h(t) = 7 \sin \frac{\pi}{6}(t - 2) + 12.5$ is a model for the average number of hours of daylight per month, beginning at the turn of the millennium. Solve for t if $h(t) = 13$ and $0 \leq t \leq 240$.