Name____ Date__________

9.6 Modeling with Trigonometric Functions

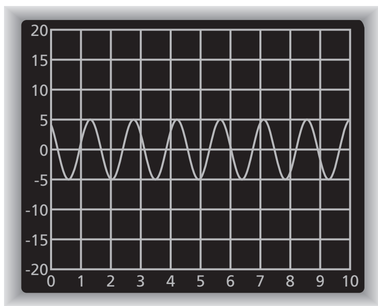
For use with Exploration 9.6

Essential Question What are the characteristics of the real-life problems that can be modeled by trigonometric functions?

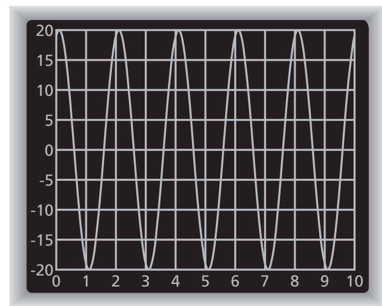
1 EXPLORATION: Modeling Electric Currents

Work with a partner. Find a sine function that models the electric current shown in each oscilloscope screen. State the amplitude and period of the graph.

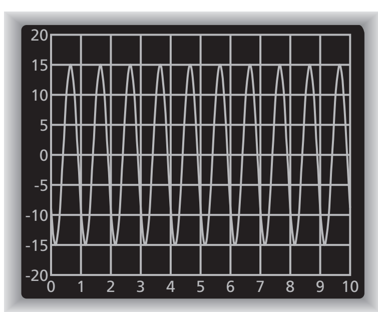
a.



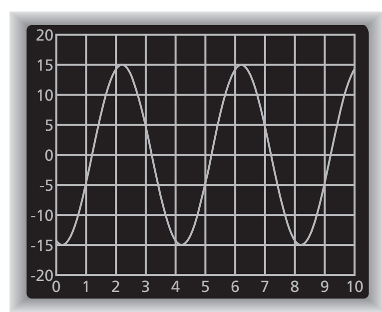
b.



c.



d.



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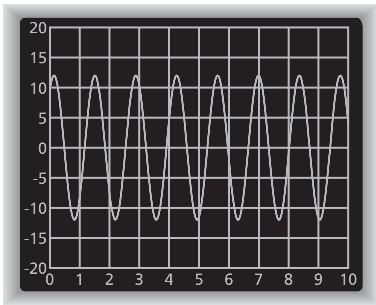
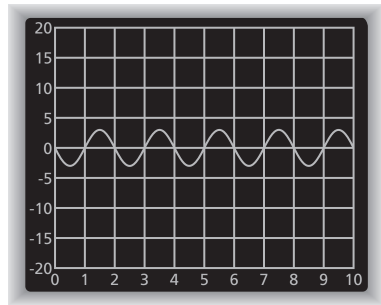
Name ____ Date __________

1 EXPLORATION: Modeling Electric Currents (continued)

e.



f.



Communicate Your Answer

2. What are the characteristics of the real-life problems that can be modeled by trigonometric functions?

3. Use the Internet or some other reference to find examples of real-life situations that can be modeled by trigonometric functions.

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Name____ Date __________

9.6 Notetaking with Vocabulary

For use after Lesson 9.6

In your own words, write the meaning of each vocabulary term.

frequency

sinusoid

Notes:

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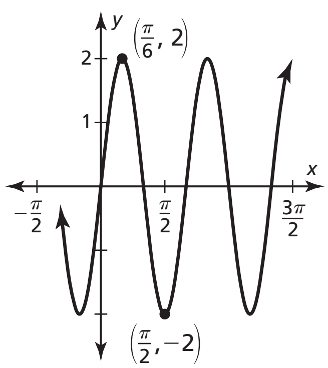
Extra Practice

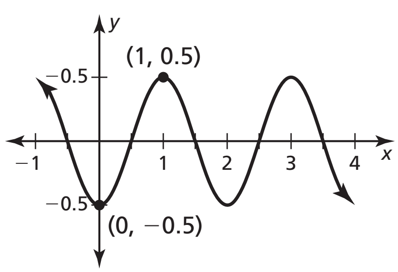
1. An alternating current generator (AC generator) converts motion to electricity by generating sinusoidal voltage. Assuming that there is no vertical offset and phase shift, the voltage oscillates between −170 volts and +170 volts with a frequency of 60 hertz. Write and graph a sine model that gives the voltage *V* as a function of the time *t* (in seconds).

In Exercises 2–5, write a function for the sinusoid.

2.



3.



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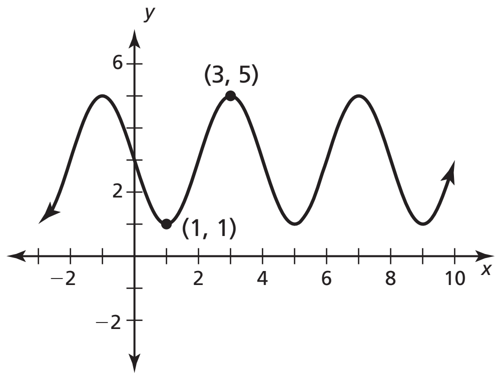
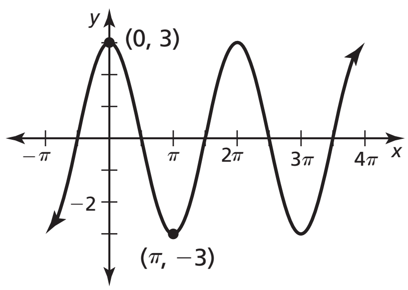
9.6 Notetaking with Vocabulary (continued)

4.



5.



6. The pedal of a bicycle wheel is 7 inches long. The lowest point of the pedal is 4 inches above the ground. A cyclist pedals 3 revolutions per second. Write a model for the height h (in inches) of the pedal as a function of the time t (in seconds) given that the pedal is at its lowest point when $t = 0$.

7. The London Eye, the tallest Ferris wheel in Europe, has a diameter of 120 meters and the whole structure is 135 meters tall. The Ferris wheel completes one revolution in about 30 minutes. Write a model for the height h (in meters) of a passenger capsule as a function of the time t (in seconds) given that the capsule is at its highest point when $t = 0$.

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