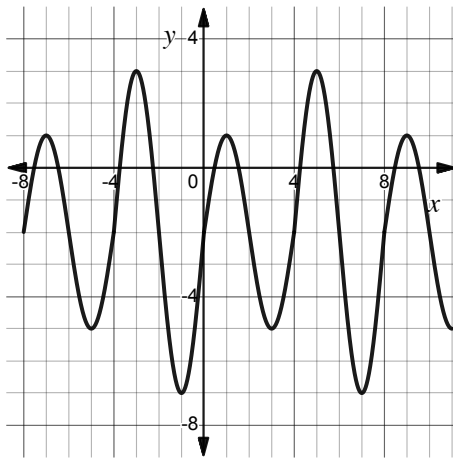


**HW 6-1**

NAME \_\_\_\_\_

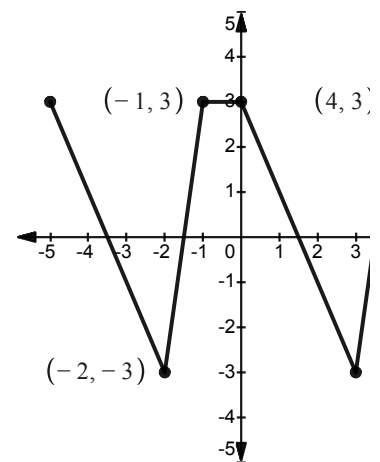
1. A portion of a periodic function is shown. Identify the period of the function.



2. Determine if each situation could be modeled by a periodic function. Give a reason for your answer.
- a. A person's distance from a specific seat in the bleachers as they walk laps around the track.
  - b. A person's distance from the cash register as they walk up and down the aisles of a grocery store.
  - c. The height of the left bike pedal when the biker is traveling at a constant speed.
  - d. The height of a ping pong ball as two players hit the ball back and forth.

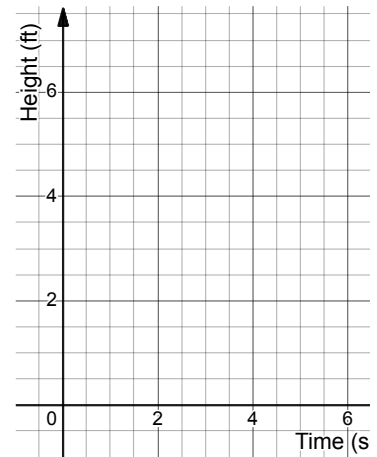
3. The periodic function  $h$  has a domain of all real numbers and a period of length 5. Two periods of  $h$  are shown in the graph.

- a. Find  $h(18)$ .
- b. On which subintervals of  $[-10, 10]$  is  $h$  constant?
- c. Does  $h$  have a positive, negative, or zero slope at  $x = 116$ ? Explain.

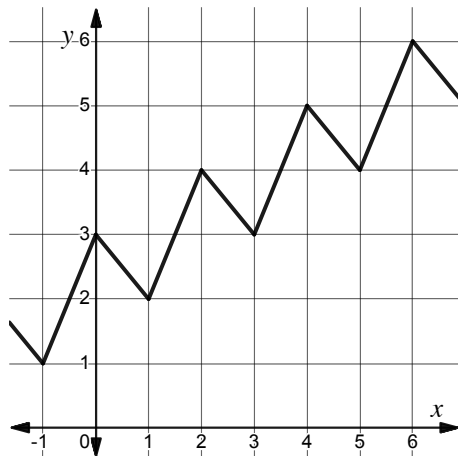


4. Kara is 5 feet and 9 inches tall. When she stands with her arms to her side, her fingertips are 3 feet and 3 inches from the ground. When her two hands meet above her head with straight arms, her fingertips are 1 foot above her head. Kara is doing jumping jacks. She starts each jumping jack with her arms flat against her sides. It takes Kara 30 seconds to do 20 jumping jacks.

- a. Sketch a graph that gives the height of Kara's fingertips above the ground over an 8-second time interval.
- b. Identify the period of your graph. Interpret your answer in the context of this problem.



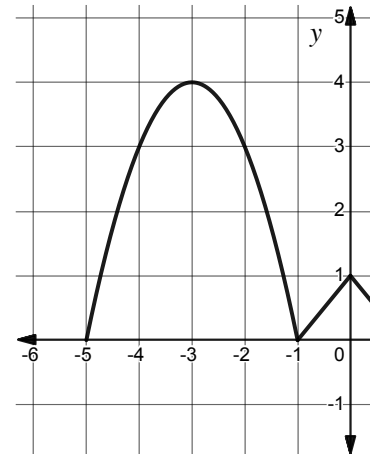
5. Is the following graph periodic? Explain.



6. One cycle of a periodic function,  $f$ , is shown.

a. Find  $f(160)$ .

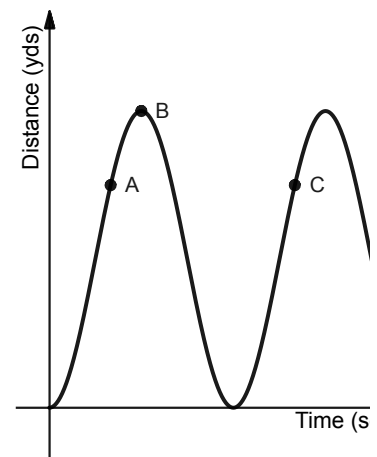
b. Is the rate of change of  $f$  positive, negative, zero, or undefined at  $x = 45$ ?



7. Michael swims laps in the pool at the local recreational center. The pool is 25 yards long and it takes him about 21 seconds to get from one side to the other. This is considered one lap. The graph shows Michael's distance from the south end of the pool during his swim.

a. Find the coordinates of Point B and interpret your answer in the context of this problem.

b. Find the coordinates of Point D and interpret your answer in the context of this problem.



c. At points A and C, Michael is 18.75 yards away from the south end of the pool. How many seconds

have passed between Point A and Point C? Give a reason for your answer.

- d. Approximate the next time after Michael is at Point A that he is **18.75** yards away from the south end of the pool.
- e. Callie says that since Michael swims **25** yards every **21** seconds, he must be swimming at a constant rate. Do you agree or disagree? Explain.