**Example 8** A Trigonometric Breath of Life

The graph in Figure 4.76 shows one complete normal breathing cycle. The cycle consists of inhaling and exhaling. It takes place every 5 seconds. Velocity of air flow is positive when we inhale and negative when we exhale. It is measured in liters per second. If $y$ represents velocity of air flow after $x$ seconds, find a function of the form $y = A \sin Bx$ that models air flow in a normal breathing cycle.

![Velocity of Air Flow in a Normal Breathing Cycle](image)

**81.** The function

$$y = 98.6 + 0.3 \sin \left( \frac{\pi}{12} x - \frac{11\pi}{12} \right)$$

models variation in body temperature, $y$, in °F, $x$ hours after midnight.

a. What is body temperature at midnight?

b. What is the period of the body temperature cycle?

c. When is body temperature highest? What is the body temperature at this time?

d. When is body temperature lowest? What is the body temperature at this time?