5. [13 points] In Western Japan (as in many other places around the world), electrical outlets supply power in the form of alternating current, which means that the voltage changes over time. The voltage goes from a maximum of 141 volts to a minimum of $-141$ volts and back again, 60 times every second. Let $V(t)$ be the voltage of an electrical outlet in Western Japan, where $t$ is time, in seconds. Assume that $V(t)$ is obtained from the function $\sin(t)$ by performing shifts, stretches and/or reflections, and that at time $t = 0$, the voltage of the outlet is at 141 volts.

a. [5 points] Find the period, amplitude, and midline of $V(t)$. (Include units.)

   Period: __________________
   Amplitude: __________________
   Midline: __________________

b. [5 points] On the axes provided, sketch a graph of $y = V(t)$ for two periods. (Clearly label the axes and be very careful with the shape and key features of your graph.)

\[\text{Graph} \]

\[\text{Axes} \]

\[\text{Key Features} \]

- Maximum at 141 volts
- Minimum at $-141$ volts
- Period: 60 seconds
- Midline: 141 volts

\[\text{Shape} \]

- Sinusoidal curve
- Symmetric around midline
- Amplitude: 141 volts

\[\text{Transformation} \]

1. A horizontal compression by a factor of $\frac{1}{2}$
2. A vertical compression by a factor of $\frac{60}{141}$
3. A shift upward by 60 units

\[\text{Find a formula for} \ P(t) \ \text{in terms of} \ V(t). \]

\[\text{Answer:} \ P(t) = \]