3. [13 points] Jada remembers from her time in Dreamland that the temperature was very consistent every day: It would increase from a low of 45°F at 2 am to a high of 75°F at 2 pm. The temperature, in degrees Fahrenheit, \( h \) hours after midnight could be modeled by a sinusoidal function \( T(h) \). Dreamland days are 24 hours.

a. [4 points] On the axes below, sketch a graph of \( y = T(h) \), showing at least one full period. Clearly label the axes and important points on your graph. Be very careful with the shape and key features of your graph.

![Graph of T(h)](image)

b. [5 points] Find a sinusoidal formula for \( T(h) \). You do not need to show work.

\[ T(h) = -15 \cos \left( \frac{2\pi}{24} (h - 2) \right) + 60 \]

Answer:

(1) \( g^{-1}(20) \)

**Solution:** \( g^{-1}(20) \) is the temperature, in degrees Fahrenheit, when the line is 20 meters long.

(ii) \( g(T(14)) = 8 \).

**Solution:** At 2 pm, the line for Alf’s apple stand is 8 meters long.