1. Solve for a: $m \cdot 3^{ab} = k \cdot e^a$. (Here, b, k and m are constants.)

2. Suppose that the temperature of an office is given by $Q(t) = Q_0 + a\sin(\frac{\pi}{6}t)$, where Q is in °F and t in hours after 8AM. What are the meaning of Q_0 and a? Suggest some reasonable values for these parameters.

3. Sketch a graph of the temperature function given in (2). Do not substitute values for unspecified parameters.

4. Find the equation of a quadratic polynomial $f(x)$ that has each of the following properties:
   ○ $f(1) = 0$,
   ○ $f(0) = 2$,
   ○ $f(x)$ opens down, and
   ○ the vertex of the graph of $f(x)$ is at $x = -1$.