3.1 Quadratic Functions & Models

1. Find the vertex of the quadratics.
   a) \( f(x) = 4x^2 - 8x - 9 \)

   b) \( g(t) = t^2 - 3t + 2 \)

4. Sketch the graph of the quadratic functions.
   a) \( f(x) = 4x^2 - 8x - 9 \)

   b) \( g(t) = t^2 - 3t + 2 \) (identify its intercepts).

5. The profit \( P \) (in dollars) for a manufacturer of collector Lumberjack Axes is given by

   \[
   P(x) = -0.0002x^2 + 140x - 250,000
   \]

   where \( x \) is the number of axes. What production would yield the maximum profit?