1. (2 points) A company manufactures two products. The price function for product A is $p(x) = 16 - x$ where $0 \leq x \leq 16$ for product B is $q(y) = 19 - \frac{1}{2}y$ where $0 \leq y \leq 38$, both in thousands of dollars, where

\begin{align*}
  x &= \text{the number of units of product A} \\
  y &= \text{the number of units of product B}.
\end{align*}

If the cost function is

$$C(x, y) = 10x + 12y - xy + 6,$$

(in thousands of dollars), find the quantity and prices of the two products that maximize profit. What is the maximum profit?