1. (10 pts.) You are planning a fence around a rectangular garden plot as shown at right. One side of the garden will be fenced with fancy material that costs $3 per foot of fencing. The other three sides will cost only $1 per foot. If the total cost cannot exceed $120, what dimensions will give you the largest area?

Let \( x \) & \( y \) be lengths of sides (in feet).

- Cost of fancy side: \( 3x \)
- Cost of other sides: \( x + 2y \)

\[
120 = 3x + x + 2y
\]
\[
120 = 4x + 2y
\]
\[
60 = 2x + y
\]
\[
60 - 2x = y
\]

Area \( A = xy = x(60 - 2x) \).

Max when \[
\begin{align*}
x &= 15 \text{ ft} \\
y &= 30 \text{ ft}
\end{align*}
\]