Solution to #25 on pg. 270 in the book.

By similar triangles
\[
\frac{y}{8.5} = \frac{x}{\sqrt{x^2 - (8.5-x)^2}}
\]

\[
y^2 = \frac{x^2(8.5)^2}{17x - (8.5)^2}
\]

\[
L^2 = x^2 + y^2 = \frac{17x^3 + (8.5)^2x^2 - x^2(8.5)^2}{17x + (8.5)^2}
\]

\[
= \frac{2x^3}{2x + 8.5} = \Psi(x)
\]

\[0 \leq x \leq 8.5\]

\[\Psi'(x) = 2x^2, \quad \frac{4x - 25.5}{(2x + 8.5)^2}\]

So \(\Psi(x)\) is maximized at \(x = \frac{25.5}{4}\).