P. 331, Problem 58.

Let $p$ be the price of a rental unit.
Let $R$ be the revenue.

Revenue = price of rental $\times$ no. of units rented.

\[
R := p \rightarrow p \cdot \left( 100 - \frac{p - 800}{10} \right);
\]

\[
p \rightarrow p \left( 180 - \frac{1}{10} p \right)
\]  

(1)

To find $p$ that yields the maximum revenue take the derivative of $R$, set it to 0 and solve. The value of $p$ will be 900. The maximum revenue is $R(900)$.

\[
R(900); \quad 81000
\]

(2)

Note that at 800 or 1000 per rental the revenue is less.

\[
R(800); \quad 80000
\]

(3)

\[
R(1000); \quad 80000
\]

(4)

Here is a plot of revenue versus rental price.

\[
plot(R, 800 .. 1000);
\]