Homework Assignment #5
Due Monday, May 14, 2007

1 Use the simplex method to maximize the objective function $P = 5x - 2y$ subject to the constraints:
\[
\begin{align*}
2x + y &\leq 6 \\
2x + 2y &\leq 8 \\
x &\geq 0 \\
y &\geq 0
\end{align*}
\]

2 Use the simplex method to maximize the objective function $P = 4x - y + z$ subject to the constraints:
\[
\begin{align*}
2x + 3y + 3z &\leq 210 \\
x + y + z &\leq 100 \\
x &\geq 0 \\
y &\geq 0 \\
z &\geq 0
\end{align*}
\]

3 (a) Use algebraic methods to find the exponential function that satisfies the data in the following table; then determine the value of $x$ that gives $y = 30$. You may solve the equation in the last step graphically.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>45</td>
</tr>
</tbody>
</table>

(b) Use a regression on your calculator to find an exponential function that best fits the data in the table below; then estimate from a graph the value of $x$ that gives $y = 100$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>200</td>
</tr>
</tbody>
</table>

Practice Problems
Do not turn these in.

Section 4.3, # 1, 3, 5, 11, 13, 15, 17, 19, 21, 23, 25

Section 5.3, # 1, 3, 5, 7, 9, 11, 13, 15, 21, 23, 25, 27, 29, 31, 33