Announcements

1. Our final examination will take place in LS 107, on Wednesday, May 2, from 4-6 pm.

Problems

1. Represent graphically the solutions of the following systems of inequalities:
   a) \[
   \begin{align*}
   x & \geq 0 \\
   y & \geq 0 \\
   x + y & \leq 6 \\
   x & \geq y \\
   2x + y & \geq 5
   \end{align*}
   \]
   b) \[
   \begin{align*}
   0 & \leq x - 1 < 7 \\
   x - 3y & > -1 \\
   x + y & \geq 4 \\
   x, y & \text{ are integers.}
   \end{align*}
   \]

2. Maximize and minimize \( C(x, y) = 25x + 30y \) subject to the constraints:
   \[
   \begin{align*}
   2x + 3y - 96 & \leq 0 \\
   5x + 7y & \leq 140 \\
   x & \leq 15 \\
   y & \leq 20 \\
   x & \geq 0 \\
   y & \geq 0
   \end{align*}
   \]

3. A dietician wishes to include beef and pork in a diet so that its nutrition values are at least:

<table>
<thead>
<tr>
<th></th>
<th>Protein</th>
<th>Fat</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>192 units</td>
<td>168 units</td>
<td>16 units</td>
</tr>
<tr>
<td>Pork</td>
<td>96 units</td>
<td>336 units</td>
<td>4 units</td>
</tr>
</tbody>
</table>

   The nutrition values of each kilogram of beef and pork are shown below:

   If beef costs $28 per kg and pork $24 per kg, find the the cost-minimizing diet and the minimum cost of making that diet.
4. A transportation scheme is made to transport a minimum of 60 children from a school for a field trip. There are totally nine 5-passenger cars, five 10-passenger mini-buses and 13 drivers available. Determine the numbers of cars and mini-buses to be used in each of the following cases:

   a) to carry the maximum number of children,
   b) to employ the least number of drivers,
   c) to run the scheme at the lowest cost, given that the running costs of a car and a mini-bus for the trip are $25 and $75 respectively.