Problem 1

Consider the following table of long run total cost for three different firms as they produce from one to seven units of some good:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm A</td>
<td>$60</td>
<td>$70</td>
<td>$80</td>
<td>$90</td>
<td>$100</td>
<td>$110</td>
<td>$120</td>
</tr>
<tr>
<td>Firm B</td>
<td>$11</td>
<td>$24</td>
<td>$39</td>
<td>$56</td>
<td>$75</td>
<td>$96</td>
<td>$119</td>
</tr>
<tr>
<td>Firm C</td>
<td>$21</td>
<td>$34</td>
<td>$49</td>
<td>$66</td>
<td>$85</td>
<td>$106</td>
<td>$129</td>
</tr>
</tbody>
</table>

For each firm, tell over what range of output the firm has economies of scale and/or diseconomies of scale.

Firm A

Firm B

Firm C
Problem 2 – Competitive Firms

1) How does a competitive firm decide what quantity it should produce?

2) Suppose that a firm’s marginal cost curve crosses its AVC curve when price is $7 and crosses the ATC when price is $11.
   a) Suppose the market price is $12.
      Will the firm produce in the long run? __________
      Is the firm earning a profit? __________
   b) Suppose now the market price is $9
      Will the firm produce in the short run? __________
      Is the firm earning a profit? __________

3) Suppose that the long run supply curve in some industry is horizontal and that we are currently at a point of long run equilibrium. You can assume that all firms in the industry have the same cost curves. Now, suppose that consumers’ tastes change and this results in a decrease in demand which in turn results in a lower price in the market.
   a) At this lower price, are firms earning a profit or loss? __________
   b) How does the industry move back to a point on the long run supply curve?
### Problem 3 – Monopoly

<table>
<thead>
<tr>
<th>P</th>
<th>Q</th>
<th>TR</th>
<th>TC</th>
<th>Profit</th>
<th>MR</th>
<th>MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>0</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>___</td>
<td>___</td>
<td></td>
<td></td>
<td>___</td>
</tr>
</tbody>
</table>

a) Fill out all of the columns in the table above assuming fixed costs are $2 and that total costs increase by $3 for each unit produced.

b) What price and quantity would a profit-maximizing monopolist choose?

Price  ______  Quantity  ______

c) Graph the marginal revenue, marginal cost, and demand curves on the grid on the following page. **Important note:** when graphing the MR, use the midpoint of the quantities. Eg. If the MR going from 2 to 3 units is $5, plot the $5 where Q is 2.5. Also, you only need to graph the MR curve where MR > 0).

At what quantity do the marginal revenue and marginal cost curves cross?

Quantity  ______

d) What price and quantity would we observe if this were a competitive industry?

Price  ______  Quantity  ______

e) Calculate the deadweight loss in the industry and also shade in the area of the deadweight loss on the graph on the following page?

Deadweight Loss  ______