1) Suppose that we have the following information on prices and production levels in the US:

<table>
<thead>
<tr>
<th></th>
<th>Manufacturing</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>Quantity</td>
</tr>
<tr>
<td>January 1983</td>
<td>$50</td>
<td>300</td>
</tr>
<tr>
<td>January 2013</td>
<td>$105</td>
<td>450</td>
</tr>
<tr>
<td>January 2014</td>
<td>$115</td>
<td>440</td>
</tr>
</tbody>
</table>

a) Suppose that the average household spends 60% of their budget on manufactured goods and 40% on services. Calculate a fixed weight index (i.e. the CPI). For 2013 and 2014 using 1983 as the base year. Calculate the inflation rate for the CPI.

\[
P_{2013} = (.60)\left(\frac{105}{50}\right) + (.40)\left(\frac{30}{20}\right) = 1.86
\]

\[
P_{2014} = (.60)\left(\frac{115}{50}\right) + (.40)\left(\frac{31}{20}\right) = 2.00
\]

\[
\pi = (\ln(2.00) - \ln(1.86)) \times 100 = 7.25\%
\]

b) Using the production levels above, calculate a variable weight index (i.e. the GDP deflator) - use 1983 as your base year. Calculate the inflation rate for the GDP deflator.

\[
P_{2013} = \frac{105(450) + 30(800)}{50(450) + 20(800)} = \frac{71,250}{38,500} = 1.85
\]

\[
P_{2014} = \frac{115(440) + 31(850)}{50(440) + 20(850)} = \frac{76,950}{39,000} = 1.97
\]

\[
\pi = \left[\ln(1.97) - \ln(1.85)\right] \times 100 = 6.28\%
\]