ANSWERS TO THE REVIEW QUESTIONS AT THE END OF CHAPTER 3

1) Consider the following bundle of goods:

100 loaves of bread
75 quarts of milk
1/100 21" Panasonic color TV.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>p\text{bread}</td>
<td>$1.00</td>
<td>$1.10</td>
<td>$1.11</td>
<td>$1.15</td>
<td>$1.27</td>
</tr>
<tr>
<td>p\text{milk}</td>
<td>$1.50</td>
<td>$1.50</td>
<td>$1.65</td>
<td>$1.60</td>
<td>$1.76</td>
</tr>
<tr>
<td>p\text{TV}</td>
<td>$300</td>
<td>$330</td>
<td>$330</td>
<td>$305</td>
<td>$336</td>
</tr>
</tbody>
</table>

a) calculate the price index for each year

\[ P_{1987} = (100)(1) + (75)(1.50) + (1/100)(300) = 215.50 \]

\[ P_{1988} = 225.80 \]

\[ P_{1989} = 238.05 \]

\[ P_{1990} = 238.05 \]

\[ P_{1991} = 262.36 \]

b) Must all individual prices rise for the price index to rise? \( \text{NO} \)

c) If individual prices change, must the price index change? \( \text{NO} \)

2) a) Suppose nominal GDP was $5,400,000,000 in 1990 and $5,750,000,000 in 1991. Calculate real GDP in both years and its growth rate. Use the price index that you calculated in the previous problem to move from nominal GDP to real GDP.

real GDP in 1990 = \$5,400,000,000/238.05 = 22,684,310 bundles

real GDP in 1991 = \$5,750,000,000/262.36 = 21,916,450 bundles

The growth rate is \( [(22,684,310 - 21,916,450)/22,684,310](100) = -3.39\% \)
b) Suppose the quality of the TV set improved significantly from 90 to 91 so that the
90 model sold for only $290 in 1991. How would this affect your calculation of real
GDP.

In this case the appropriate price level in 1991 is

\[(1.27)(100) + (1.76)(75) + (290)(1/100) = 261.9\]

Since the price level for 1991 has fallen, the new figure for real GDP will be
higher, and the growth rate from 90 to 91 will also be higher (though it will still
be negative).

3) Let 1988 be the base year and recalculate the standardized price index for each year.

\[
P_{87}^S = 95.4
\]
\[
P_{88}^S = 100
\]
\[
P_{89}^S = 105.4
\]
\[
P_{90}^S = 105.4
\]
\[
P_{91}^S = 116.2
\]

4) Calculate the inflation rate over each period. We denote the inflation rate by the greek letter
\((\pi)\). For example, \(\pi_{88}\) is the inflation rate from 1987 to 1988, and is given in decimal form
by \(\pi_{88} = (P_{88} - P_{87})/P_{87}\). Report the rates in both decimal and percentage form. Check to see if
your answer changes when you use the standardized price index in your calculations.

\[
\pi_{88} = .048 \quad 4.8\%
\]
\[
\pi_{89} = .054 \quad 5.4\%
\]
\[
\pi_{90} = 0 \quad 0\%
\]
\[
\pi_{91} = .102 \quad 10.2\%
\]