Quiz #4
Applied Calculus I – Math 131.009 – Fall 2012

Name (Everyone must work alone on this Quiz): 

Show your work for credit.

1. (2 pts) Let $P(t)$ represent the population of Poland (in millions of people) $t$ years after 2000. If $P(10) = 38.5$ and $P'(10) = -0.1$, estimate Poland’s population at the end of 2014.

\[
P(14) \approx P(10) + P'(10)(14 - 10)
\]

\[
= 38.5 - 1(4) = 38.1 \text{ million people}
\]
2. (8 pts) A high school principal is concerned about the drop in the percentage of students who graduate from her school, shown in the following table.

<table>
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<tbody>
<tr>
<td>Percent graduating, ( P )</td>
<td>65.1</td>
<td>62.4</td>
<td>58.0</td>
<td>61.5</td>
<td>45.8</td>
</tr>
</tbody>
</table>

(a) Calculate the average rate of change of \( P \) between 1998 and 2004. Include units.

\[
\frac{\Delta P}{\Delta t} = \frac{45.8 - 58.0}{2004 - 1998} = -2.03 \, \% / \text{year}
\]

(b) Explain in practical terms (i.e., in words! not math) the meaning of your answer in (a).

The % of students graduating fell 2.03 per year, on average, each year between 1998 and 2004.

(c) Based on the data above, find a good approximation for \( P'(1995) \). Include units.

\[
\]

(I also accepted going left instead of right and also the avg. of the two)

(d) Explain in practical (not mathematical) terms the meaning of your answer in (c).

In 1995, the % graduating was decreasing at 1.47 per year.