

Math 162

Quiz 7

Show all work in a neat and organized fashion. Clearly indicate your answers.
10 points possible.

1. (5 pts.) Kelly Services saw an increase in gross profit from \$184.2 million in 1984 to \$463.0 million in 1994 (Kelly Services *Annual Report*, 1994). Calculate the average rate of change and percentage change in Kelly's profit from 1984 through 1994. Clearly state which is which. Include correct units for each!

2. (5 pts.) The national unemployment rates (in percentage points) from July 1995 through January 1996 can be modelled by

$$U(t) = 0.02476t^2 - 0.48095t + 7.85429 \text{ percent}$$

where t is the number of months since December 1994 (based on data from the United States Department of Labor). (If you wish to graph it, a good window is $x_{\min}=7$, $x_{\max}=13$, $y_{\min}=5.5$, $y_{\max}=5.8$). In this problem, you will find the rate of change in unemployment in December 1995 by using the “+ h ” method.

Do not round your answers.

(a) Find the unemployment rate when $t = 12$.

(b) Write a formula for the unemployment rate when $t = 12 + h$. Simplify your answer.

(c) Write a formula for the slope of the secant line connecting the points at $t = 12$ and $t = 12 + h$. Simplify your answer.

(d) What is the limiting value of the slope formula in part (c) as h approaches 0?