Name:_____ Date:_____

Unit 1a: HOMEWORK Estimation to Speed Limit Law

24) The population P(t) (in thousands) of Belgium from 1992 to 2000 is shown in the table. (Midyear estimates are given). Let t=years since 1992.

Year	1992	1994	1996	1998	2000
P(t)	10,036	10,109	10, 152	10,175	10,186

a) Given $\frac{10{,}152-10{,}109}{2}$

What quantity does this calculation represent in the context of this problem (use appropriate units)?

b) Estimate the instantaneous rate of growth in 1996. Show all work and give your answer in appropriate units.

c) Estimate the equation of the tangent to P at t=4. Show all work. Use appropriate notation.

d) Use your tangent from part c to estimate the population in the year 2002. Show all work and give your answer using appropriate units and using appropriate notation.

(source: Stewart, James: Calculus (Early Transcendentals), 5e edition, p. 154-157)

25) The number N(t) (in thousands) of cellular phone subscribers in Malaysia is shown in the table. (Midyear estimates are given). Let t=years since 1993.

Year	1993	1994	1995	1996	1997
N (t)	304	572	873	1513	2461

a) Calculate the average rate of change from 1994 to 1996 and explain its meaning in the context of the problem using appropriate units.

b) Estimate the instantaneous rate of growth in 1995. Show all work and give your answer in appropriate units.

c) Estimate the equation of the tangent to N at t=4. Show all work. Use appropriate notation.

d) Use your tangent from part c to estimate the number of subscribers in the year 1998. Show all work and give your answer using appropriate units and using appropriate notation.

(source: Stewart, James: Calculus (Early Transcendentals), 5e edition, p. 154-157)