Name: _____

4-digit code: _____

- Write your name and the last 4 digits of your SSN in the space provided above.

- The test has five (5) pages, including this one.

- For multiple-choice questions, circle the answer you select. On the other problems, you should enter your answer in the box(es) provided.

- Show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit.

- Credit for each problem is given at the right of each problem number.

- No books or notes may be used on this test. Calculators are allowed, provided they don't have a computer algebra system.

Page	Max	Points
2	20	
3	30	
4	25	
5	25	
Total	100	

Problem 1 (10 pts)**.** The solid waste generated each year in the cities of the US is increasing. The solid waste generated (in millions of tons) was 238.3 in 2000 and 251.3 in 2006.

- Assume that it increases **linearly**. Find a formula for this function.

<div style="border:1px solid black; width:300px; height:100px;"></div>

- Use this formula to predict the amount of solid waste generated in the year 2020.

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Problem 2 (10 pts)**.** Winning height in men's Olympic pole vault

year	1960	1964	1968	$\cdots$	1992	1996	2000
height (in)	185	201	213	$\cdots$	228	233	232

What is the average rate of change in height from 1992 to the year 2000?

(a) $\dfrac{8}{213 - 185}$

(b) $\dfrac{213 - 185}{8}$

(c) $\dfrac{8}{232 - 228}$

(d) $\dfrac{232 - 228}{8}$

Problem 3 (10 pts). Find the average rate of change of $y = f(x) = \sqrt{x}$ between $x = 4$ and $x = 9$. Show work to get credit.

(a) 3

(b) 5

(c) $\frac{1}{3}$

(d) $\frac{1}{5}$

Problem 4 (10 pts). Determine the slope and y–intercept of the line with equation $3x = 6y + 12$.

Slope m:

(a) $m = \frac{1}{4}$

(b) $m = -\frac{1}{4}$

(c) $m = \frac{1}{2}$

(d) $m = -\frac{1}{2}$

y–intercept b:

(a) $b = -2$

(b) $b = \frac{1}{3}$

(c) $b = 2$

(d) $b = -\frac{1}{3}$

Problem 5 (10 pts). For certain antibiotic, 40% of the drug is eliminated every hour (not continuosly). Find a function that expresses the quantity of antibiotic in the blood after t hours, assuming that the initial dose is 200 mg.

Problem 6 (15 pts)**.** The fixed cost for factory and machinery needed to begin production in a wallet company is \$24,000. The cost of labor and raw material amounts to \$7 per manufactured wallet. What is the total cost function?

If wallets sell for \$15 each, what is the revenue function?

What is the break even point?

Problem 7 (10 pts)**.** The gross domestic product of Switzerland, G, was 310 billion dollars in 2007. Give a formula for G (in billions of dollars) t years after 2007 if G increases by 40% a year (not continuously).

Problem 8 (15 pts). One of the tables below represents a supply curve; the other represents a demand curve.

p	182	167	153	143	133	125	118
q	5	10	15	20	25	30	35

p	6	35	66	110	166	235	316
q	5	10	15	20	25	30	35

Which one is the demand curve?

(a) The first table.

(b) The second table.

At a price of $155, approximately how many items would consumers purchase?

(a) between 10 and 15.

(b) between 20 and 25.

(c) The question cannot be answered with the offered data.

What would the price have to be if you wanted consumers to buy at least 20 items?

(a) 143

(b) 10

(c) between 5 and 10

Problem 9 (10 pts). Find a formula for the population of Nevada as a function of time, assuming that the population increases exponentially, and the following data: In 2000, the population of Nevada was 2.02 million. In 2006, it was 2.498 million.

When will the population reach 3 million?