

Simon Fraser University
Department of Mathematics
Burnaby Campus

MATH 157-3, Summer 2008
Midterm 2
July 2nd, 2008, 11:30 – 12:20

Last Name (please print): _____

First Name (please print): _____

Student Number: _____

Instructor: P. Menz

Instructions:

1. DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO.
2. Fill in the above box.
3. This exam contains 7 pages with a total of 5 questions. Once the exam begins please check to make sure your exam is complete.
4. SHOW ALL YOUR WORK!
5. If you run out of space in a problem, use the space on the back of the previous page and clearly indicate where the solution continues.
6. Only scientific, non-programmable calculators with no differentiation and integration capabilities are allowed.
7. No book, paper, or device, other than the usual writing instruments, this booklet and an acceptable calculator, shall be within reach of a student during the examination.
8. During the examination, speaking to, communicating with, or deliberately

exposing written papers to the view of other examinees is forbidden.

9. Try your Best!

Do not write in this table!	
Question	Marks
1	/7
2	+ /12
3	/4
4	/7
5	/10
Total	/40

1. Suppose the demand function for a certain product is given by $p = 4000 - 5x^2$.
This equation tells us the price that must be charged per unit to sustain a demand of x units.



a) Write down the formula for the elasticity of demand E . [**1 mark**]

b) Find the elasticity of demand E as a function of x . [**3 marks**]

c) Find and interpret the elasticity of demand when $x = 20$. [**3 marks**]

2. Find the indicated derivative provided it exists. Do not simplify. **[12 marks]**

a) $f(x) = xe^{4x-3}$, $f'(x)$



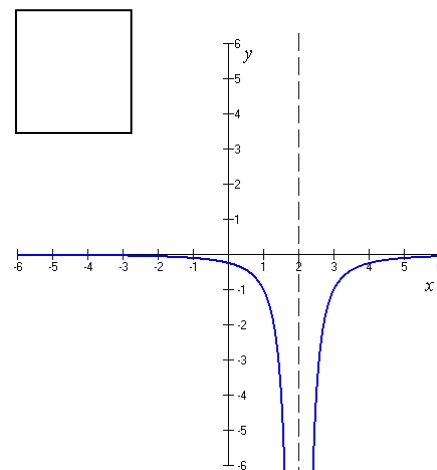
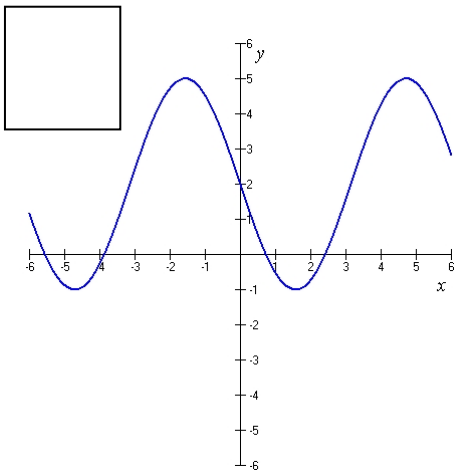
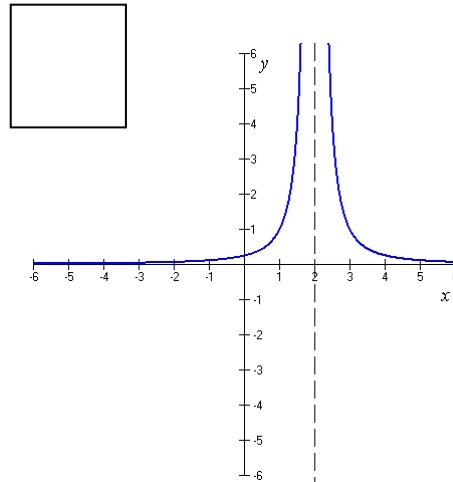
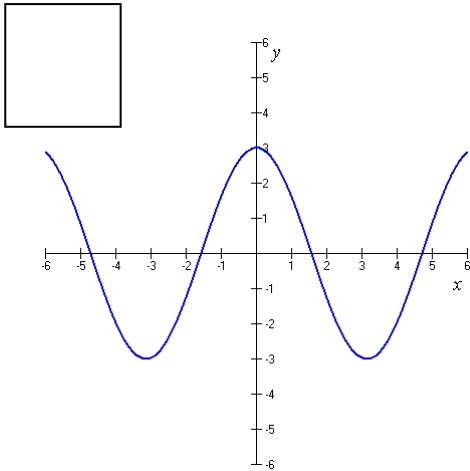
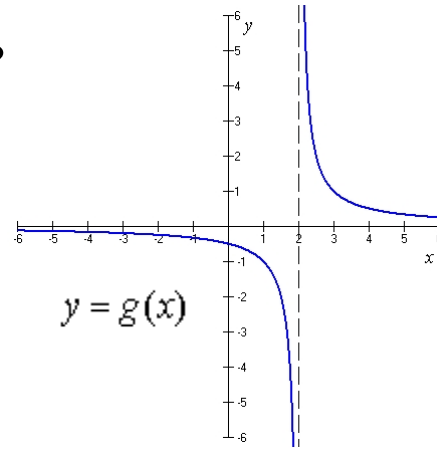
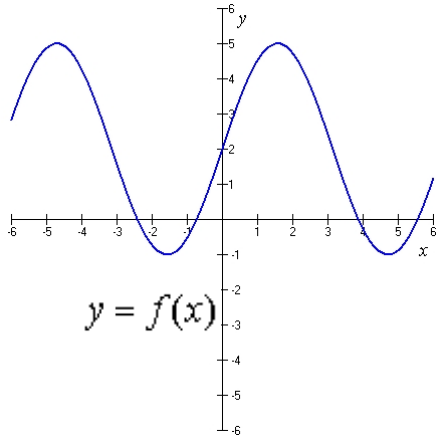
b) $y = \log_3 \frac{(x+2)^5}{x-4}$, y'

c) $g(x) = \tan x$, $g''(x)$

d) $\sin y = \cos(x^4)$, $\frac{dy}{dx}$



3. You are given the graphs of two functions $y = f(x)$ and $y = g(x)$ defined for all real numbers. Below are 4 further graphs. Identify those graphs that are the first derivative of f and g respectively and label the curves by placing $f'(x)$ and $g'(x)$ into the appropriate box. [4 marks]



4. Approximate to two decimal places the value of $\sqrt{15.6}$ using linear approximation, differentials, or Newton-Raphson method. **[7 marks]**



5. A certain property in Vancouver grows exponentially from being valued at \$250,000 in the year 2000 to \$400,000 in the year 2006. Let t measure time in years with $t = 0$ meaning year 2000. **[10 marks]**

a) Write an exponential function that models this.



b) What will be the approximate value of the property in 2010?