Name: _____ Student Number:_____

MATHEMATICS 1K03E

Summer Session #2, 2008

Test #2 - Practice Version

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TERM TEST
EVENING CLASS
DURATION OF TEST: **60 min**
MCMASTER UNIVERSITY TERM TEST

Tuesday, June 10, 2008

THIS TEST INCLUDES 7 PAGES AND 10 QUESTIONS. YOU ARE RESPONSIBLE FOR ENSURING YOUR COPY OF THE TEST IS COMPLETE. BRING ANY DISCREPANCY TO THE ATTENTION OF YOUR INVIGILATOR.

Instructions:

1. Only the Casio FX-991 calculator is allowed to be used on this test.
2. Make sure your name and student number at the top of each page.
3. In part A, PRINT the letter corresponding to the answer of your choice on **page 2**, in the box beside the corresponding question number below.
4. **A blank answer is an automatic zero for any question** in part A, even if the correct solution is circled on the question itself.
5. Incorrect or multiple answers for part A are also worth zero marks. No negative marks or part marks will be assigned.
6. In part B, provide complete solutions on this test paper in the space provided below each question. Part marks are available.
7. Each question in part A is worth 1 mark, and in part B each question is worth 3 marks.
8. Rough work paper will be provided upon request. All rough work must be handed in with the test, but any solutions written on the rough paper will **NOT** be graded.
9. *Good Luck!*

Name: _____ Student Number:_____

Grade/Answer Chart

Part A

Question	*Ans.*	*Question*	*Ans.*
#1		*#5*	
#2		*#6*	
#3		*#7*	
#4		*#8*	

Total Grade Part A: _____/8

Part B

Question	*Grade*
#9	
#10	

Total Part B: _____/6

Net Grade :

_____/14

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Name: _____ Student Number:_____

Part A

Remember: Write the letter of your selection in the chart on Page #2

1. Using implicit differentiation, and the expression:

$$y = x + \sqrt{y}$$

find the derivative of y:

a) $y' = 1 + \dfrac{1}{2\sqrt{y}}$ **b)** $y' = \dfrac{2\sqrt{y}}{2\sqrt{y} - 1}$ **c)** $y' = \sqrt{y}$ **d)** $y = 1 - 2\sqrt{y}$ **e)** $y' = 0$

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2. Given $\log_2 a = 0.10$ and $\log_2 b = -0.42$, evaluate the expression:

$$\log_2\left(a^2 \cdot \sqrt{b}\right)$$

a) 8 **b)** -0.952 **c)** 0.378 **d)** -0.01 **e)** Does not exist

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3. Where is the functon:

$$y = x + \frac{1}{\sqrt{x}}$$

concave up?

a) All real x **b)** $x > 0$ **c)** $x \leq 0$ and $x > 1$
d) $0 < x < 1$ **e)** No real x

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Remember: Write the letter of your selection in the chart on Page #2

4. A square-bottomed box, without a top is to be constructed to hold 40cm³ of goo. The bottom of the box is to be made of bronze, with a cost of 10¢/cm². The sides are made of aluminium with a cost of 1¢/cm². This gives us a cost equation:

$$C = 10x^2 + 4x\left(40/x^2\right)$$

Where C is the total cost in cents, and x is the size of any edge of the square bottom. (Also, $40/x^2$ is the box height.)
What is the minimum possible cost?

a) \$1.20 **b**) \$1.40 **c**) \$2.00 **d**) \$62.50

e) There is no minimum

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5. Given the functions:

$$f(u) = \frac{1}{u-2}, \quad g(x) = \sqrt{x}$$

evaluate the derivative of $f(g(x))$ when $x = 9$.

a) $-\frac{\sqrt{7}}{98}$ **b**) $-\frac{1}{42}$ **c**) $\frac{1}{4}$ **d**) $-\frac{1}{6}$ **e**) 1

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6. Solve the following expression for x:

$$3^{(x^2+1)} = \frac{1}{9^x}$$

a) 0 **b**) $-\frac{2}{3}$ **c**) $\frac{3}{4}$ **d**) -1 **e**) No Solution

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Remember: Write the letter of your selection in the chart on Page #2

7. The cost of producing a certain rubber widget is related to the price per kilogram of rubber by the equation:

$$C = 12p^3 - 6p + 20$$

Given the price of rubber is currently 5$/g, how fast will the cost of producing the widget increase if the price of rubber increases at a rate of 0.50$/g·yr?

a) 3.00 $/yr **b**) - 4.50 $/yr **c**) 1.50 $/yr **d**) 6.50 $/yr **e**) 18.50 $/yr

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8. Using the first derivative test on:

$$p(x) = x^3 - 6x^2 + 12x - 17$$

at the point where x=2, a critical point of p, what do we know about $p(x)$?

a) There is a local max at $x = 2$ **b**) There is a local min at $x = 2$

c) There is an inflection point at $x = 2$ **d**) $p(x)$ is decreasing near $x = 2$

e) There is neither a local max nor min at $x = 2$

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Name: _____ Student Number:_____

Part B

Remember: In this section, you need to include full solutions to get full marks.

9. Find and describe all the horizontal and vertical asymptotes of the function:

$$h(x) = \frac{x + 2}{x^2 - 4}$$

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Remember: In this section, you need to include full solutions to get full marks.

10. Find the regions of concavity and inflection point(s) of the function:

$$h(x) = 3x^5 - 5x^4 + 7x + 2$$

THE END