OLD EXAM

2015-2016 Term 2

Arts & Science
MATH 116 CALCULUS II

Midterm 2

17 March 2016

(**50** marks available on this paper)

Put a check mark to indicate your <u>LECTURE</u> <u>SECTION</u> and <u>INSTRUCTOR</u>:

______ 02 John Martin

______ 04 Lawrence Chang

______ 06 Derek Postnikoff

______ 96 Lawrence Chang

Please ***print*** your names and IDs in ***ink***:

Family Name: ______________________________ **First Name**: ______________________________

Student ID: ________________________________

NSID: ______________________

INSTRUCTIONS

1. Time Limit: **80 minutes**

2. **Closed book. Closed notes. No calculators**.

3. Write clearly and legibly.

4. **Simplify answers** unless otherwise instructed.

5. All answers to be marked as well as rough work are to be written inside this booklet. Students are not allowed to use their own scrap paper for doing rough work.

6. Check that you have **14 printed pages**. Pages 6, 9, and much of page 14 may be used for doing rough work.

7. Work lacking enough details may not be credited.

8. Numbers that are enclosed in square brackets, [ ], indicate the number of marks allotted for that question.

Evaluate the integrals in problems #1-7.

[5] 1. $\displaystyle\int \tan x \sin^2 x \, dx$

[5] 2. $\int \ln\sqrt{x}\, dx$

[5] 3. $\int \frac{\sin^2(1/x)}{x^2}\, dx$

[5] 4. $\displaystyle\int \frac{\sqrt{x^2-9}}{x}\,dx$

The space on this page may be used for scratch work. If you use this page to answer a question, please clearly indicate on the original question page that you are doing so.

[5] 5. $\displaystyle\int \frac{1}{e^{-x}+1}\,dx$

[5] 6. $\displaystyle\int \frac{2x^2 + x + 4}{x^3 + 4x}\,dx$

The space on this page may be used for scratch work. If you use this page to answer a question, please clearly indicate on the original question page that you are doing so.

[5] 7. $\displaystyle\int \frac{\sqrt{x}+1}{x-1}\,dx$

[5] 8. If the work required to stretch a spring 1 ft beyond its natural length is 12 ft-lb, how much work is needed to stretch it 9 inches beyond its natural length ? Assume Hooke's Law.

[5] 9. Find the average value of the function $f(x) = \dfrac{1}{\sqrt{4-x^2}}$ on the interval $\left[0, \sqrt{3}\right]$.

[5] 10. A trough is 10 ft long and its ends have the shape of isosceles triangles that are 4 ft across at the top and have a height of 3 ft. If the trough is full of water weighing ρ lb/ft^3, how much work is required to pump all the water to a level 3 ft above the top of the tank? Leave your final answer in terms of ρ.

Much of the space on this page may be used for scratch work. If you use this page to answer a question, please clearly indicate on the original question page that you are doing so.

Markers Use Only:

		1	**2**	**3**	**4**	**5**	**6**	**7**
						8	**9**	**10**

Total: (out of 50)