MATH 1710 Test #1

Tuesday 10 February 2009 (5:30-6:30 pm) Time: 60 minutes

Name: _____ ID#: _____

INSTRUCTOR (please check one): [ ] BERRY (A01) [ ] PRYMAK (A02)

VALUE

|10| 1. Evaluate the integral $\int_0^{\sqrt{3}} \frac{x^3}{\sqrt{x^2+1}}\,dx$. (SHOW ALL YOUR WORK AND SIMPLIFY YOUR ANSWER)

|4| 2. Set up (BUT DO NOT EVALUATE) integrals to determine the following physical quantities:

(a) The AREA of the region enclosed by the curves $x = 0$, $y = e^x$ and $y = e^{2x} - 2$:

Set up (BUT DO NOT EVALUATE) integrals to determine the following physical quantities (continued):

[5] (b) The LENGTH of that portion of the curve given by $x = \ell n(y+1)$ which lies between the vertical lines $x = 0$ and $x = \ell n(4)$:

(c) The VOLUME of the solid of revolution obtained when the region enclosed by $x = \sqrt{2-y}$, $y = 0$ and $x = 1$ is revolved ABOUT THE LINE $x = -1$, using

[5] (i) the "washers" method :

[6] (ii) the "cylindrical shells" method :

Set up (BUT DO NOT EVALUATE) integrals to determine the following physical quantities (continued):

[5] (d) The WORK DONE to lift one end of a chain, lying initially on the ground, and having mass of 50 kg. and a total length of 50 m., vertically upward to a height of 20 metres above ground level. [You may ignore friction.]:

[5] (e) The TOTAL FLUID FORCE exerted on one face of a circular plate, of radius 3 m., which is immersed vertically into a water so that the top of the plate is 1 metre ABOVE the surface of the fluid:

Problem	1	2(a)	2(b)	2(c)	2(d)	2(e)	TOTAL
MARK							
Total	10	4	5	11	5	5	40