University of Lethbridge

Department of Mathematics and Computer Science

5 December, 2017

MATH 1560 - Test #6 – Group Stage

Examiner: Sean Fitzpatrick

Record the names of your group members below. Groups must contain between 3 and 5 members.

Please print clearly.

1. Last Name:______________________________ First Name:______________________

2. Last Name:______________________________ First Name:______________________

3. Last Name:______________________________ First Name:______________________

4. Last Name:______________________________ First Name:______________________

5. Last Name:______________________________ First Name:______________________

Print your name and student number clearly in the space above. You may remove this cover page, and use the back for scrap paper. If you want any work on the back of this page to be graded, you must clearly indicate this on the page containing the corresponding question.

Answer the questions in the space provided. Show all work and necessary justification. Partial credit may be awarded for partially correct work.

No outside aids are permitted, with the exception of a basic calculator.

1. Compute the following antiderivatives:

[3] (a) The antiderivative F of $f(x) = 2x + \sec^2(x)$ such that $F(0) = 4$.

[3] (b) $\displaystyle\int (3x^2 + 2\sqrt{x} - 5)\, dx$

[3] (c) $\displaystyle\int \left(\cos(x) - \frac{1}{\sqrt{1-x^2}}\right) dx$

[3] (d) $\displaystyle\int x^3 e^{x^4+2}\, dx$

2. Use Part I of the Fundamental Theorem of Calculus to compute the derivatives of the following functions:

[2] (a) $F(x) = \int_2^x \sin(t^2 + 3t)\, dt$

[3] (b) $G(x) = \int_x^{x^2} \sqrt{t^4 + 1}\, dt$

3. Use Part II of the Fundamental Theorem of Calculus to evaluate the following definite integrals:

[3] (a) $\int_0^1 \left(3x^2 - 2x + 4\right)\, dx$

[4] (b) $\int_0^{\pi/2} \cos(x) \sin^3(x)\, dx$

 Total Points: 30

Extra group questions!

[3] 4. Evaluate the integral $\int_0^2 |2x-2|\,dx$.

Suggestion: either use properties of integrals to simplify, or sketch the graph and evaluate by interpreting the result as an area.

[3] 5. Find the area between the curves $y = 2 - x^2$ and $y = x^2$ for $0 \leq x \leq 3$.

 Total Points: 30