Math 1700 Summer 2013
Exam 2
Tuesday July 2 2013
No Work = No Credit

Name: _____ **Student Number:** _____

Signature: _____

Instructor: _____ **Section:** _____

Instructions: Answer all questions and show all of your work. The use of books, notes or calculators is not permitted.

Problem	Points	Student's Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	25	
7	25	
Total:	100	

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Name: _____ **Student Number:** _____

1. (10 points) Evaluate the integral

$$\int \frac{1}{x^2\sqrt{x^2-16}}dx.$$

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2. (10 points) Evaluate the integral:

$$\int \frac{1}{x^2\sqrt{4x+1}}dx$$

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3. (10 points) Find the exact area of the surface obtained by rotating the curve

$$y = \frac{x^3}{6} + \frac{1}{2x}, \qquad \frac{1}{2} \leq x \leq 1$$

about the x-axis.

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4. (10 points) Find the exact length of the curve

$$y = \frac{x^4}{8} + \frac{1}{4x^2}, \qquad 1 \leq x \leq 2.$$

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5. (a) (5 points) Evaluate the integral:

$$\int \sec^3(x)dx.$$

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(b) (5 points) Evaluate the integral:

$$\int \sin^4(x)\cos^3(x)dx.$$

Name: _____ **Student Number:** _____

6. (a) (5 points) Determine if the integral is convergent or divergent, and if it is convergent, evaluate it:

$$\int_0^\infty \frac{e^x}{e^{2x}+1}dx.$$

Name: _____ **Student Number:** _____

(b) (5 points) Determine if the integral is convergent or divergent, and if it is convergent, evaluate it:

$$\int_2^\infty \frac{1}{x^2+2x-3}dx.$$

Name: _____ **Student Number:** _____

(c) (5 points) Determine if the integral is convergent or divergent, and if it is convergent, evaluate it:

$$\int_1^\infty \frac{e^{-x}}{2+x^2}dx.$$

Name: _____ **Student Number:** _____

(d) (5 points) Determine if the integral is convergent or divergent, and if it is convergent, evaluate it:

$$\int_1^\infty \frac{1}{x^4} dx.$$

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(e) (5 points) Evaluate the integral:

$$\int_{-\infty}^{\infty} \frac{1}{1+x^2}\,dx.$$

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7. (a) (5 points) Determine if the **sequence** is convergent or divergent, and if it is convergent, find its **limit**:

$$\left\{ \frac{\ln(n)}{\ln(2n)} \right\}.$$

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(b) (5 points) Determine if the **sequence** is convergent or divergent, and if it is convergent, find its **limit**:

$$\left\{ \frac{\tan^{-1}(n)}{n} \right\}.$$

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Name: _____ **Student Number:** _____

(a) (5 points) Determine if the series is convergent or divergent, and if it is convergent, find its sum:

$$\sum_{n=1}^{\infty} \frac{k(k+2)}{(k+3)^2}.$$

Name: _____ **Student Number:** _____

(b) (5 points) Determine if the series is convergent or divergent, and if it is convergent, find its sum:

$$\sum_{n=1}^{\infty} \frac{e^n}{n^2}.$$

Name: _____ **Student Number:** _____

(c) (5 points) Determine if the series is convergent or divergent, and if it is convergent, find its sum:

$$\sum_{n=1}^{\infty} \frac{1}{n^3 - n}.$$