Math 141 Quiz #2 Thursday, October 18, 2012

Name: _____ Section: _____

There are 6 multiple choice problems, and 3 short answer problems. **Please mark all multiple choice answers in the box provided.**

| Question | Answer |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |

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

   (a) 1

   (b) $\frac{1}{2}$

   (c) 0

   (d) $\frac{3}{2}$

   (e) The integral diverges.

2. Does $\lim_{x \to 0+} x^x$ converge? If so, what does it converge to?

   (a) 1

   (b) $e^{-1}$

   (c) 0

   (d) $e$

   (e) The limit diverges.

3. Let $a_n = n \cdot \sin\left(\frac{1}{n}\right)$. Find $\lim_{n \to \infty} a_n$.

   (a) 0

   (b) $\frac{\pi}{2}$

   (c) 1

   (d) $-\frac{\pi}{2}$

   (e) The limit diverges.

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4. $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{3 \cdot 4^{n-1}}{3^n}$

   (a) $\frac{7}{9}$

   (b) $\frac{3}{7}$

   (c) $\frac{7}{3}$

   (d) $\frac{9}{7}$

   (e) The series diverges.

5. $\sum_{n=1}^{\infty} \ln\left(\frac{x+2}{x+1}\right)$

   (a) $-\ln(2)$

   (b) $0$

   (c) $1$

   (d) $\ln(3) - \ln(2)$

   (e) The series diverges.

6. $\sum_{n=1}^{\infty} 5 \, \frac{2^{n-1}}{3^{2n}}$

   (a) $\frac{5}{7}$

   (b) $\frac{35}{9}$

   (c) $\frac{9}{7}$

   (d) $\frac{45}{7}$

   (e) The series diverges.

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7. (2 points) Use the comparison test to determine if the following integral converges. You must show all work to get full credit.

$$\int_1^\infty \frac{x}{\sqrt{x^4 - x}}\, dx$$

8. (2 points) First, write out the first three terms of the sequence $\{(-1)^{n-1} + \cos(n\pi)\}$ and **simplify each term** completely. Then, compute $\lim_{n\to\infty} a_n$.