Assessment Data is from what semester?  May 22, 2014

Faculty Name(s): Bob Bradshaw

1. Course Name and Number:
   Math 101B: Calculus II

2. All Course SLOs from the Course Outline of Record:
   1. Manipulate mathematical expressions involving integration at the mastery level.
   2. Manipulate expressions involving infinite sequences and series to determine convergence and approximation to transcendental functions, at the beginning level.
   3. Apply integral calculus to problems involving volumes of solids, arc length, surface area, physics, and differential equation applications, at the intermediate level.
   4. Use the methods of calculus to analyze the qualitative behavior of parametric and polar equations and conic sections, at the intermediate level.
   5. Use technology to analyze functions found in integral calculus, at the intermediate level.

3. Specific Course SLO(s) assessed as part of this project:
   Manipulate expressions involving infinite sequences and series to determine convergence and approximation to transcendental functions, at the beginning level. In particular, I am interested in "approximation to transcendental functions".

4. Is this course on GE Plan A?  Yes, Area IV Language and Rationality

5. How did you assess the SLO(s)? (Attach any related documents at end of form.)
   The assessment was done via a chapter exam on the material, as is typically done in higher level math courses.

6. Results and analysis of the data. (Attach any related documents at end of form.)
   The students did quite well on the material, with 47% of the students taking the exam earning a score of 80% or higher. The area of particular interest, approximation to transcendental functions, is related to questions 9 - 11 on the exam. On these questions students performed extremely well, with approximately three-fourths of the class scoring at the 90% level.

7. What are you going to do based on the results of the data? (Any planned revisions?)
   no revisions required

Please save your finished document in the following format. (Date should be for the semester in which data was collected; same date should be listed at top of this form.)
   yyyysemester-sloa-courseid.doc
   example: 2014spring-sloa-eng101c.doc
1. (10 points) Determine the limit of the sequence $a_n = \left( 1 + \frac{2}{n} \right)^{3n}$.

2. (10 points) Find the terms $a_2$, $a_3$, $a_4$ of the sequence $a_n = a_{n-1} - a_{n-2}$, $n \geq 2$ where $a_0 = 2$ and $a_1 = 1$.

3. (10 points) Write the general term $a_n$ for the sequence $1, \frac{3}{2}, \frac{9}{2}, \frac{27}{4}, \frac{81}{8}, \frac{243}{16}, \ldots$.

4. (10 points) Find the infinite sum $2 - \frac{2}{3^1} + \frac{2}{9^2} + \ldots$. Assume $a > 1$ and be sure to show your work.

5. (10 points) Find the infinite sum $\sum_{k=1}^\infty \frac{2}{k^2 + 2k}$. Be sure to show your work.

6. Determine if the following series converge or diverge. Be sure to state the test being used and show your reasoning.

   (a) (10 points) $\sum_{k=1}^\infty \frac{2^k}{k^2}$
   
   The series □ converges □ diverges by the ___________ test because

   (b) (10 points) $\sum_{k=1}^\infty \ln k
   
   The series □ converges □ diverges by the ___________ test because

7. (10 points) Use the alternating series remainder formula to determine the number of terms required for the infinite sum $\sum_{k=1}^\infty (-1)^k k^3$ to be approximated with accuracy $10^{-12}$.

8. (10 points) Determine the interval of convergence of the series $\sum_{k=1}^\infty \frac{(-1)^k (x - 2)^k}{2^k k^3}$. You do not need to check the endpoints.

9. (10 points) Use the formula sheet to find the first four terms of the series for $\sqrt{1 - 4x}$.

10. (10 points) Use the formula sheet to find the first four terms of the series for $\int_0^1 \cos t^2 \, dt$.

11. (10 points) Use the Taylor series formula for $\cos x$ with 3 terms to estimate $\cos 0.3$. Also, find the value of $\cos 0.3$ using the button on your calculator. For the series, be sure to write down the terms you use and use 6 decimal places for your answers.

   Value from the series: ________________

   Value from the button: ________________