Calculus II	**Name:** _____
Study Guide 30	**Class:** _____
Due Date: _____	**Score:** _____

No Work ⇔ No Points

Use Pencil Only ⇔ Be Neat & Organized

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1. Use partial fractions decomposition to write as a telescoping series, then find the sum.

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

   (a) _____

   (b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^2+3n+2}$.

   (b) _____

   (c) (4 points) $\displaystyle\sum_{n=2}^{\infty} \frac{2}{n^2-1}$.

   (c) _____

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2. Use the Alternating Series Test to determine whether the following series is convergent or divergent.

(a) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt[3]{n}}$.

(a) _____

(b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{\cos[(n-1)\pi]}{n^2+4}$.

(b) _____

(c) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{\sin\left[(2n-1)\pi/2\right]}{n^5}$.

(c) _____

3. Use the Comparison Test or the Limit Comparison Test to determine whether the following series is convergent or divergent.

(a) (4 points) $\displaystyle\sum_{n=1}^{\infty} \tan\frac{1}{n^2}$.

(a) _____

(b) (5 points) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n+5^n}$.

(b) _____

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4. (5 points) Determine whether the series $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$ is convergent or divergent.

4. _____

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5. Use the Root Test or the Ratio Test to determine whether the following series is convergent or divergent.

(a) (4 points) $\displaystyle\sum_{n=1}^{\infty} \frac{3^n n!}{5^n (n+2)!}$.

(a) _____

(b) (4 points) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{n}{2n-1}\right)^{2n}$.

(b) _____

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6. (5 points) Determine whether the series $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{3^n + 4^n}$ is convergent or divergent.

6. _____
