Calculus II	**Name:**
Study Guide 27	**Class:**
Due Date:	**Score:**

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

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1. (3 points) Write out the first four terms of the sequence $\left\{\dfrac{n^2}{2n+1}\right\}_{n=1}^{\infty}$.

1. _____

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2. (3 points) Write out the first four terms of the sequence $\left\{\dfrac{\ln n}{n}\right\}_{n=1}^{\infty}$.

2. _____

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3. (3 points) Write out the first four terms of the sequence $\left\{\dfrac{(-1)^{n+1}}{n^2}\right\}_{n=1}^{\infty}$.

3. _____

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4. (4 points) Determine whether the sequence $\left\{n \sin \frac{\pi}{n}\right\}_{n=1}^{\infty}$ converges, and if so find its limit.

4. _____

5. (5 points) Determine whether the sequence $\left\{\sqrt{n^2+4n}-n\right\}_{n=1}^{\infty}$ converges, and if so find its limit.

5. _____

6. (5 points) Determine whether the sequence $\left\{\left(\frac{n+3}{n+1}\right)^n\right\}_{n=1}^{\infty}$ converges, and if so find its limit.

6. _____

7. (5 points) Find $a_{n+1} - a_n$, then use it to show the sequence $\left\{\dfrac{n}{4n-1}\right\}_{n=1}^{\infty}$ is increasing or decreasing.

7. _____

8. (5 points) Find $\dfrac{a_{n+1}}{a_n}$, then use it to show the sequence $\left\{\dfrac{n^n}{n!}\right\}_{n=1}^{\infty}$ is increasing or decreasing.

8. _____

9. (5 points) use differentiation to show the sequence $\left\{\tan^{-1} n\right\}_{n=1}^{\infty}$ is increasing or decreasing.

9. _____

10. (5 points) Show the sequence $\left\{\frac{n!}{3^n}\right\}_{n=1}^{\infty}$ is increasing or decreasing.

10. _____

11. Find general term of the sequence given below

(a) (2 points) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \cdots$.

(a) _____

(b) (2 points) $\left(1-\frac{1}{2}\right), \left(\frac{1}{2}-\frac{1}{3}\right), \left(\frac{1}{3}-\frac{1}{4}\right), \cdots$.

(b) _____

(c) (3 points) $-1, 2, -3, 4, , \cdots$.

(c) _____