Calculus II	Name:
Study Guide 28	Class:
Due Date:	Score:

No Work \Leftrightarrow No Points

Use Pencil Only \Leftrightarrow Be Neat & Organized

1. Use the fact that
$$\sum_{n=1}^{\infty} a_n = \lim_{n \to \infty} \sum_{i=1}^n a_i = \lim_{n \to \infty} s_n$$
 to find $\sum_{n=1}^{\infty} a_n$ if
(a) (4 points) $s_n = \frac{n^2 - 1}{4n^2 + 1}$.

(b) (4 points)
$$s_n = \frac{2n+3}{3n+2}$$
.

(b) _____

(a) _____

2. Use the Test for Divergence that says if $\lim_{n \to \infty} a_n$ does not exist or $\lim_{n \to \infty} a_n \neq 0$, then the

series
$$\sum_{n=1}^{\infty} a_n$$
 is divergent to show the following series diverge
(a) (4 points) $\sum_{n=1}^{\infty} \frac{n(n+2)}{(n+4)^2}$.

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

(c) (4 points)
$$\sum_{n=1}^{\infty} \arctan n$$
.

(c) _____

(a) _____

(b) _____

3. Use the geometric series $\sum_{n=1}^{\infty} ar^{n-1} = \frac{a}{1-r}$ along with conditions for convergence and divergence to find the sum the following series. If diverges, you must explain.

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

(b) (5 points)
$$\sum_{n=1}^{\infty} \frac{1+3^n}{2^n}$$
.

(a) _____

(c) (5 points)
$$\sum_{n=1}^{\infty} \left(\frac{3}{\pi}\right)^n$$
.

(c) _____

4. Find the values of x for which the series below converges. Find the sum of the series in simplest form.

(a) (5 points)
$$\sum_{n=1}^{\infty} (x+4)^n$$
.

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

(b) _____

5. (5 points) Express the number $5.\overline{123}$ as a ratio of integers in simplest form. You must do this using two different methods.

5. _____