NAME :
SECTION : (circle one)

## Math 8

due Wednesday, January 20, 2010
Homework \#2 - covers Lectures 4-6

Instructions: Collaboration on homework is encouraged. The use of computing devices is allowed on homework (but not on exams). Please feel free to attach extra pages if your solutions require them. A correct answer with incorrect work will be considered wrong.

FERPA RELEASE: Because of privacy concerns, we are not allowed to return your graded homework in lecture without your permission. If you wish us to return your homework in lecture, please sign on the line indicated below. Otherwise, you will have to pick your homework up in your instructor's office.

SIGN HERE: $\qquad$

| Problem | Points | Score |
| :---: | :---: | :---: |
| 1 | 4 |  |
| 2 | 4 |  |
| 3 | 4 |  |
| Total | 12 |  |

1. (4) In the following problems, $s_{n}$ denotes the $n$th partial sum of the series $\sum_{n=1}^{\infty} a_{n}$.
(a) Compute the 4th partial sum of $\sum_{n=1}^{\infty} \frac{2}{n+2}$.
(b) If $\sum_{n=1}^{\infty} a_{n}=3$ then what are $\lim _{n \rightarrow \infty} a_{n}$ and $\lim _{n \rightarrow \infty} s_{n}$ ?
(c) If $\lim _{n \rightarrow \infty} s_{n}=4$ then what are $\lim _{n \rightarrow \infty} a_{n}$ and $\sum_{n=1}^{\infty} a_{n}$ ?
2. (4) This two-part question concerns the series $\sum_{n=1}^{\infty} \frac{(2 x+1)^{n}}{3^{n}}$.
(a) For what values of $x$ does this series converge?
(b) When this series converges, it defines a function of $x$. What is this function?
3. (4) Arrange the following quantities in order from least to greatest, and explain your reasoning.

$$
\sum_{n=9}^{\infty} \frac{1}{n^{2}+1} \quad \int_{10}^{\infty} \frac{d x}{x^{2}+1} \quad \int_{9}^{\infty} \frac{d x}{x^{2}+1}
$$

