MAT319, Fall 2007 Second Midterm

11/9/2007

Name: _____ **ID:** _____

Question	Points	Score
1	25	
2	30	
3	30	
4	15	
Total:	100	

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1. [25 points] Is the infinite series $\sum_{n=1}^{\infty} \frac{1}{-1+2n\sqrt{n}}$ convergent? (If yes, you don't need to find the value).

2. [30 points] What is $\lim_{x\to\infty} \frac{7x^2+1}{\sqrt{2x+5}}$?

3. [30 points] Use the definition of the limit (I mean use "ϵ, δ") to prove that

$$\lim_{x \to 3} \frac{2x^2 + 4}{x - 1} = 11.$$

4. [15 points] Let $f : \mathbb{R} \to \mathbb{R}$ be a function such that for any $x \in \mathbb{R}$, we have

$$|f(x) - f(1)| < 6\sqrt{|x-1|}$$

Show that such a function f is continuous at $x = 1$. (You will get some partial credit if you recall the definition of continuit of a function at a point.)