QUIZ 8 - MATH 152 Friday, November 13

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Read each problem **very carefully** before starting to solve it. Each problem is worth 3 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find a formula for the n-th term of the sequence $a_1 = \frac{1}{1}$, $a_2 = -\frac{1}{4}$, $a_3 = \frac{1}{9}$, $a_4 = -\frac{1}{16}$, ...

2. Use the function method (with brief explanations) to compute $\lim a_n$ if $a_n = \frac{\ln n}{n}$, $n \geq 1$.

3. Use the squeeze method (with brief explanations) to compute $\lim a_n$ if $a_n = \frac{\sin n}{n}$, $n \geq 1$.

4. Write in summation notation $-\frac{2}{9}+\frac{4}{25}-\frac{6}{49}+\frac{8}{81}-\cdots$.

5. Use our analysis of the convergence of the geometric series to compute the sum of the infinite series
$$\sum_{n=0}^{\infty}\frac{3(-2)^{n+2}-5^n}{8^n}.$$

6. Use the divergence test (with brief explanations) to show that the following infinite series diverges: $\displaystyle\sum_{n=1}^{\infty}\frac{n}{2015n+2016}$.