Quiz 4 **Calculus 1** **11/11/2005**

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Find the first three partial sums of the series $\sum_{n=1}^{\infty} \frac{1}{n^2}$.

$S(1) = \frac{1}{1^2} = \underline{1}$

$S(2) = \frac{1}{1^2} + \frac{1}{2^2} = \underline{\frac{5}{4}}$

$S(3) = \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} = \underline{\underline{\frac{49}{36}}}$

$\frac{4}{4} + \frac{1}{4} + \frac{1}{9}$

$\frac{5}{4} + \frac{1}{9}$

$\frac{45}{36} + \frac{4}{36} = \frac{49}{36}$

Great

---

2. Find the sum of the series $2 - \frac{1}{2} + \frac{1}{8} - \frac{1}{32} + \frac{1}{128} - \ldots$.

$a_n = 2(-\frac{1}{4})^n$

$n=0$

$\underline{a = 2}$

$r = \underline{-\frac{1}{4}}$

$2 + \left(2 \cdot -\frac{1}{4}\right) + \left(-\frac{1}{2} \cdot -\frac{1}{4}\right) + \left(\frac{1}{8} \cdot -\frac{1}{4}\right) + \left(-\frac{1}{32} \cdot -\frac{1}{4}\right)$

geo<u>metric</u>

$\sum a_n = \frac{2}{1 - -\frac{1}{4}} = \frac{2}{5/4} = \boxed{\frac{8}{5}}$

Excellent