Quiz 3a Calc 2 4/23/2003

Each problem is worth 5 points. For full credit provide complete justification for your answers.

1. Write the first four partial sums of the series $\sum_{n=1}^{\infty} \frac{3n}{2^n}$.

$S_1 = \frac{3(1)}{2^{(1)}} = 3/2$

$S_2 = \frac{3(1)}{2^{(1)}} + \frac{3(2)}{2^{(2)}} = 3$

$S_3 = \frac{3(1)}{2^{(1)}} + \frac{3(2)}{2^{(2)}} + \frac{3(3)}{2^{(3)}} = 33/8$

$S_4 = \frac{3(1)}{2^{(1)}} + \frac{3(2)}{2^{(2)}} + \frac{3(3)}{2^{(3)}} + \frac{3(4)}{2^{(4)}} = 39/8$

2. Find the sum of the series $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots$.

geometric series with $r = 1/3 < 1$, so the series is convergent.

$S_n = \frac{a}{1-r}$

$S_n = \frac{1}{1-1/3} = \frac{1}{2/3} = 3/2$