Quiz #1. Answer key.

1. (6 pts) Evaluate the limit.

(a) $a_n = \dfrac{3^{n+1}}{4^n}$. Answer: 0. By using $\lim_{n\to\infty}(\dfrac{3}{4})^n = 0$.

(b) $a_n = \ln(3n+1) - \ln(2n)$. Answer: $a_n = \ln(\frac{3n+1}{2n}) \to \ln(3/2)$.

(c) $a_n = \dfrac{(-1)^n}{2\sqrt{n}}$. Answer: 0. Note that $|a_n| = \dfrac{1}{2\sqrt{n}} \to 0$.

2. (4 pts) Find

$$\sum_{n=1}^{\infty}(\frac{1}{3^n} + \frac{3}{n(n+1)})$$

Answer: $\dfrac{7}{2}$. By using $\displaystyle\sum_{n=1}^{\infty}\frac{1}{3^n} = \frac{1}{2}$ and $\displaystyle\sum_{n=1}^{\infty}\frac{1}{n(n+1)} = 1$.

wrong 1 it is 3