Homework for the lecture on Nov 23

1. (a) Assume that $a_k \to 0$, show that

$$\sum_{k=1}^{\infty}(a_k - a_{k+1}) = a_1.$$

(b) Sum the series

$$\sum_{k=1}^{\infty} \frac{2k+1}{2k^2(k+1)^2}.$$

2. Determine whether each of the following series converges or diverges. Justify your answers.

(a)

$$\sum_{k=1}^{\infty} \frac{1}{k(k+1)(k+2)\cdots(k+2010)}$$

(b)

$$\sum_{k=2}^{\infty} \frac{1}{k(\ln k)^{2010}}$$

(c)

$$\sum_{k=2}^{\infty} \frac{2010^k}{(\ln k)^k}$$