Let $\theta > 0$. Let $\{a_n\}$ be a sequence of real numbers.

1. Show that $\sum a_n$ converges.

2. Let $m = \frac{1}{p}$, where $\frac{1}{p} + \frac{1}{q} = 1$. Assume $\frac{p}{q} = \frac{1}{2}$, and drop the absolute value in $\frac{q}{p}$.

3. Let $c = \frac{1}{2}$. Let $A_n$ be the set of all natural numbers such that $a_n \geq c$. Show that $\sum a_n$ converges.

4. Let $\mu = \frac{1}{2}$. Let $\varphi = \frac{1}{2}$. Show that $\sum a_n$ converges.