Problem statement Each of the following sequences has limit 0:

$$\left\{\frac{1}{\sqrt{n}}\right\}_{n=1}^{\infty} \qquad \left\{\frac{1}{n}\right\}_{n=1}^{\infty} \qquad \left\{\frac{1}{n^2}\right\}_{n=1}^{\infty} \qquad \left\{\frac{1}{10^n}\right\}_{n=1}^{\infty}$$

a) For each sequence, state exactly how large n must be to ensure that the term a_n of the sequence (and all later terms as n increases) satisfy $|a_n| < 10^{-4}$.

b) Similarly, how large must n be to ensure that $|a_n| < 10^{-8}$?

c) Use this information to explain which sequence approaches 0 most rapidly and which approaches 0 least rapidly.