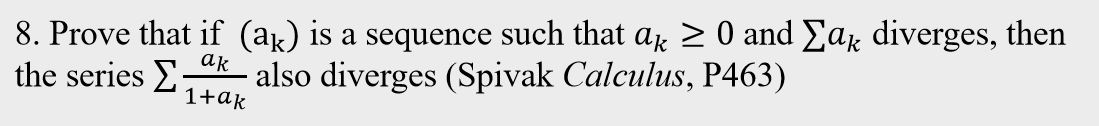


Proof: Since and converges to f uniformly, there is some such that . , there is some such that . Choose some such that . Fix this , for any we have for any . Therefore, the function sequence converges uniformly to .



Proof: If the sequence is not bounded, then there is some subsequence such that . This means . It follows that for some , . Therefore, the series diverges. If the sequence is bounded, we investigate the ratio of and : . This means for any n, . Note that is nothing but a positive number. Thus, diverges.