

An example of a converging series is  $\sum \frac{1}{2^n}$  the sequence  $\{\frac{1}{2^n}\}$  where  $\lim_{n \rightarrow \infty} \frac{1}{2^n} = 0$  and so the series  $\sum \frac{1}{2^n}$  converge.  
An example of diverging series is  $\sum n$  the sequence  $\{n\}$  has  $\lim_{n \rightarrow \infty} n = \infty$  so the series  $\sum n$  diverges by the divergence test.