

Using our precise definition of the limit of the  $n^{\text{th}}$  term of a sequence, prove each of the following:

1.  $\lim_{n \rightarrow \infty} \sqrt{\sinh \frac{1}{\sqrt[3]{n}}}$

2.  $\lim_{n \rightarrow \infty} e^{\tanh n} = e$

3.  $\lim_{n \rightarrow \infty} \sqrt{e^{-n^2+3}}$