Problem statement Consider the following sequences:

$$a_n = \left(1 + \frac{1}{n}\right)^n \; ; \quad b_n = \left(1 + \frac{1}{n^2}\right)^n \; ; \quad c_n = \left(1 + \frac{1}{\sqrt{n}}\right)^n .$$

a) Use your calculator to plot the first ten terms of each of these sequences. Then use this information to guess the limiting behavior of each of the sequences.

b) Replace n by x and use L'Hopital's Rule to find the limit of each as x tends to infinity.