Practice Problems for Section 3.6

1. Show directly from the definition that the sum and the product of two Cauchy sequences is again a Cauchy sequence.

2. Show that the sequence
$$x_n = \sum_{j=0}^{n} \frac{1}{j!}$$
satisfies a sharper estimate than the one obtained in class:
$$n > m \quad \Rightarrow \quad |x_n - x_m| \leq \frac{1}{(m+1)!}\frac{m+2}{m+1}.$$