Math 112 - Spring 2015
April 22 Warmup

Let

\[ T_n(x) = \sum_{i=0}^{n} \frac{x^i}{i!} \]

be the nth partial sum of the Maclaurin Series for \( e^x \).

1. Write out the polynomials \( T_0(x), T_1(x), T_2(x), T_3(x) \).

\[
\begin{align*}
T_0(x) &= 1 \\
T_1(x) &= 1 + x \\
T_2(x) &= 1 + x + \frac{x^2}{2} \\
T_3(x) &= 1 + x + \frac{x^2}{2} + \frac{x^3}{6}
\end{align*}
\]

2. Find \( T_0(1), T_1(1), T_2(1), T_3(1) \) as decimals (you can use your phone as a calculator).

\[
\begin{align*}
T_0(1) &= 1 \\
T_1(1) &= 1 + 1 = 2 \\
T_2(1) &= 1 + 1 + \frac{1}{2} = 2.5 \\
T_3(1) &= 1 + 1 + \frac{1}{2} + \frac{1}{6} = 2.6
\end{align*}
\]

3. Does it look like \( \lim_{n \to \infty} T_n(1) = e \)?

Yes, because the sequence 1, 2, 2.5, 2.6, \ldots looks to be approaching \( e \approx 2.718 \).