Assignment: Complete all parts below. Attach your work as a .mw (Maple) file.

<u>Part A</u> Find the first four terms of the Taylor Series expansion for $y=e^x$ about $x=0$.

<u>Part B</u> Plot the function $f(x)=e^x$ along with the Taylor approximation you found in part A on the same set of axes. Use x=-5..5 for your x-axis bounds. What do you notice about the two curves? How well does the Taylor series expansion approximate the exact curve of $f(x)=e^x$? Where is the approximation the "best"?

<u>Part C</u> Repeat parts A and B, but this time, expand the Taylor series out for the first 6 terms. Which is better and why? How could you measure the "error" of the approximation at the point x=2?

<u>Part D</u> Use the remainder formula to compare the error for the Taylor approximation found in Part A and the Taylor approximation found in part C.

<u>Part D</u> Find the first five terms of the Taylor Series expansion for $y=sin(x)$ about $x=0$. How does this compare/contrast to the series expansion for cosine?

<u>Part E</u> Find the first four terms of the Taylor Series expansion for $y=1/(x-1)$ about $x=2$. Plot the Taylor approximation, along with the original function on the same set of axes. Where is the approximation the "best"?