

Show all work clearly and in order. Please box your answers.

1. Find the **Taylor series** about the given center (at least the first four nonzero terms) of the following. Also, find the **Taylor polynomials** about the given center of orders $n = 0, 1, 2, 3, \text{ and } 4$
 - (a) e^x , $x_0 = 5$.
 - (b) $\frac{1}{x}$, $x_0 = -1$.
 - (c) $\sin(\pi x)$, $x_0 = \frac{1}{2}$.
 - (d) $\ln(x)$, $x_0 = e$.
 - (e) $\cos(x)$, $x_0 = \frac{\pi}{4}$.
2. Use your answers from part (a) above to find approximations for the value of e^6 . Compare your approximations with what your calculator approximates e^6 as. Do the same using the Maclaurin polynomials for e^x from class. Which produces a better approximation? If you were to approximate e^{-1} instead, would the Maclaurin polynomials of e^x or part (a) above be better at approximating the value?