

MATH 101 V2A – Homework

March 23rd

(a) Find the Taylor Polynomial of degree 3 centred at $a = 1$ for the function $f(x) = \frac{e^x}{x}$.

(b) Use (a) to approximate $\int_1^2 \frac{e^x}{x} dx$ to within 10^{-1} of the actual value.

(c) What degree Taylor Polynomial would guarantee the approximation to be within 10^{-4} of the actual value? (Note: You do NOT have to compute the Taylor polynomial or the approximation for this question, just the degree of the polynomial.)

In the video, Taylor's Theorem with Lagrange remainder is given, and the derivatives of $f(x) = \frac{e^x}{x}$ are computed and bounded. Watch the video and use those calculations to help answer the above questions. You do NOT have to hand anything in for this homework assignment, but you may be asked to contribute to the solution on the board. Your grade will be based primarily on participation rather than the correctness of your work, provided you demonstrate that you have watched the video.