

Quiz X

(Where $x > 10 \in \mathbb{N}$)

- 1) Consider $f(x) = xe^{x^2}$. Estimate the $\int_0^1 f(x) dx$ three ways. a) Using the midpoint rule with 10 subdivisions. b) Using trapezoidal rule with 10 subdivisions. c) Using Simpson's rule with 10 subdivisions.

For each approximation i) find the approximation (once you have set up your sum you may use web based calculators to evaluate but I must see the sum), ii) Calculate the actual value of the integral up to 5 decimal places and find the error from your approximation iii) Find the error using the error functions in class. (Either use the equations from your notes or the equations will be posted on the website. You may also use graphing calculators to determine your k values.)

- 2) In your own words which is a better approximation and why? (**This MUST be done on your own.** If I suspect ANYONE has copied then those who copied and those who were copied off of will get **0s** and **EVERYONE will have to do an approximation problem on the next exam.**)

- 3) Using the function above if I want to do Simpson's rule with n-subintervals how many n-subintervals will I need to have an error less than 1/1,000.