(1)[**5 points**] Approximate

$$\int_0^2 e^{-x^2}\, dx$$

using T_4, the trapezoid rule on four subintervals.

(2)[**5 points**] Give a bound on the error in your approximation in (a).

(3)[5 points] How large must n be for the approximation in (a) to be accurate to within 0.001?