Note: similar problems (and solutions) can be found on the sample midterms that were handed out today.

1. (*Section* 7.5) Evaluate
$$\int \frac{dx}{e^{2x} + 5e^x + 4}.$$

2. (*Section* 7.7)

   (a) Apply Simpson's rule to approximate $\int_0^3 \sec(x^2)dx$ using $n = 4$. Write your answer as a sum of secant functions.

   (b) As $n \to \infty$, how quickly does the error in Simpson's Rule go to 0, in terms of a power of n? (no need to give the other coefficients)

3. (*Section* 7.8) Which of the following is true for
$$\int_2^\infty \frac{e^{-x^3}}{x}dx?$$

   (a) The limit exists and is finite.
   (b) The limit exists and is ∞.
   (c) The limit exists and is $-\infty$.
   (d) The limit does not exist.

   Explain you answer carefully, stating all results that you are using.