Math 212-RS2 Quiz 5B

February 25, 2020

Name: _____

Instructions: Use your own scrap paper and write your answers in the space provided.

1. State the three things that can make the integral $\int_a^b f(x)\ dx$ improper:

   i. _____ and/or

   ii. _____ and/or

   iii. _____

2. Compute the following integrals if they converge, if they diverge, so state:

$(a)\ \int_0^\infty \frac{x^3}{1+x^8}dx =$ _____ $(b)\ \int_0^1 x^3 \ln\left(\frac{1}{x}\right)dx =$ _____

$(c)\ \int_0^1 \frac{e^{\sqrt{x}}}{2\sqrt{x}}dx =$ _____ $(d)\ \int_0^1 \frac{1}{\sqrt{x}}dx =$ _____

Bonus:

1. Consider the definite integral $\int_a^b f(x)\ dx$

   (a) Name three numerical approximation techniques for approximating the integral above:

   _____

   _____

   (b) State formulas for: $\Delta x =$ _____ and $x_i =$ _____ used in these approximation methods.

2. (All or nothing) Use the Comparison Theorem to determine whether or not the following integral converges. If it diverges, state "diverges" below, if it converges, enter the value it converges to.

   $\int_0^1 \frac{\sec^2 x}{x\sqrt{x}}\ dx =$ _____

   What integral did you compare it to? _____