

Math 212-RS2 Quiz 5A

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)  $\int_2^{\infty} \frac{dx}{\sqrt{x}} =$  \_\_\_\_\_ (b)  $\int_0^1 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx =$  \_\_\_\_\_

(c)  $\int_0^1 x^2 \ln\left(\frac{1}{x}\right) dx =$  \_\_\_\_\_ (d)  $\int_{-\infty}^0 \frac{x^3}{1+x^8} dx =$  \_\_\_\_\_

**Bonus:**

1. (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? \_\_\_\_\_

2. 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.