Outcomes list for Math 122 Exam I

1. Be able to evaluate an indefinite integral using the properties of the indefinite integral and using the formulas listed on page 324 – \( x^r \), trigonometry, \( e^x \), \( b^x \), \( \ln x \), and inverse trig functions.

2. Be able to solve an initial-value problem.

3. Be able to u-substitute to transform a complicated integration into simpler integration. (Make the integration problem fit the formulas in # 1.

4. Be able to use the formulas on p. 337 to antidifferentiate appropriate problems.

5. Be able to simplify summation notation using theorems and properties.

6. Be able to compute the area under a curve by the definition of area under a curve, which leads to the summation of the area of the n rectangles and the computation.

7. Be able to compute the net signed area between \( f(x) \) and interval \([a,b]\).

8. Use the Riemann integral and its properties to compute the definite integral using geometry formulas.


10. Be able to use part II of Fundamental Theorem of Calculus to compute \( \frac{d}{dx} \left[ \int_a^x f(t) \, dt \right] \). (i.e. integration and differentiation are inverse processes)

11. Be able to evaluate definite integrals that involve both u-substitution and the Fundamental Theorem of Calculus.

12. Be able to evaluate a definite integral, where the integrand is the absolute value function using properties of the integral.

13. Using a Riemann sum be able to find the area under a curve over a given interval \([a,b]\). The curve can be a polynomial function, an exponential function or a trigonometric function.

14. Be able to find the area between two function \( f(x) \) and \( g(x) \) as well as the area between the two functions \( g_1(x) \) and \( g_2(x) \).