MATH 1700 D01 Winter 2013 Assignment 1

SHOW ALL WORK to get full marks. Leave answers as exact answers. For example, leave it as e^2 as opposed to a decimal approximation.

1. Use 4 subintervals, and right endpoints, to approximate the area under the curve $y = e^{x-1}$ from $x = 1$ to $x = 2$.

2. Use the Riemann sum find the area under the curve of $y = x^3 - 2x + 3$ from $x = 1$ to $x = 3$.

3. Use the definition of the definite integral to find

$$\int_{-1}^{2} (x^2 + x - 2)dx$$

4. Use the Fundamental Theorem of Calculus to find

   (a)
   $$\int_{-1}^{2} (x^2 + x - 2)dx$$

   (b)
   $$\int_{1}^{2} \left(e^t - \frac{1}{t^3}\right)dt$$

   (c)
   $$\int_{-1}^{2} \left(\frac{y^2 + 2}{y}\right)dy$$

5. Find the following derivatives

   (a)
   $$\frac{d}{dx}\int_{-4}^{x} \left(\frac{\cos t}{t^3 + 1}\right)dt$$

   (b)
   $$\frac{d}{dx}\int_{3}^{x^3+x} \left(\frac{u \sin u}{u^2 + 3}\right)du$$

   (c)
   $$\frac{d}{dy}\int_{\sqrt{y}}^{\sec y} \left(\frac{u}{u^2 + u + 1}\right)du$$