Assessment Quiz

MATH 172 Lab: Section 8

Lab Instructor (TA): Mohammed Kaabar

Student's Name: ----------SOLUTION----------

Student's ID:----------

Note: *I will grade this as a regular quiz. However, everyone who completes the quiz will get 5 points extra credit for participation.*

Show your work and circle your answers. Neatness and organization count!

Question 1: (1 point) Suppose m is a continuous function on the interval $[n, w]$. Consider $\int_n^w m(x)\,dx$. What property must m have in order that the integral be interpreted as the area bounded by the graph of m and the x-axis, between $x = n$ and $x = w$?

A function m must be integrable function on $[n, w]$. This means the following:

$\lim_{n\to\infty} R_n = \lim_{n\to\infty} \{\sum_{i=1}^{n} m(x_i)\Delta x\}$ exists and is unique over all partitions of $[n, w]$, and all choices of x_i on a partition. (Note: Any other related answers are correct)

Question 2: (2 points) Evaluate $\int_0^1 (5 - 3k)\,dk$.

$$\int_0^1 (5 - 3k)\,dk = 5k - \frac{3k^2}{2}\Big|_0^1 = \left(5(1) - \frac{3(1)^2}{2}\right) - \left(5(0) - \frac{3(0)^2}{2}\right) = \frac{7}{2} = 3.5$$

Question 3: (2 points) Evaluate $\int \beta(\beta^2 + 4)^4 d\beta$.

We use integration by substitution as follows:

Let $u = \beta^2 + 4$, then $du = 2\beta d\beta \rightarrow$ Therefore, $\beta d\beta = \frac{du}{2}$

Now, our integral becomes as follows:

$$\int \beta(\beta^2 + 4)^4 d\beta = \int u^4 \frac{du}{2} = \frac{1}{2}\int u^4\,du = \frac{1}{2}\left(\frac{u^5}{5}\right) = \frac{u^5}{10} + c = \frac{1}{10}(\beta^2 + 4)^5 + c$$