CSD1251/CSD1250 Week 2 Homework

Due: 18th September 2023, 2359 HRS

For each question, key in **the** correct option into the homework into the "Week 2 Homework" option in the "4 September to 10 September" section in our **combined** CSD2201 and CSD2200 meta course page on Moodle.

Question 1

Suppose we want to compute the Riemann sum of a function $y = f(x)$ on $[2, 10]$ using 16 rectangles. Find Δx.

(a) $\frac{5}{8}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) $\frac{1}{16}$ (e) None of the above

Question 2

Suppose we want to compute the Riemann sum of a function $y = f(x)$ on $[4, 10]$ using 18 rectangles, and we wish to use right endpoints as sample points. Which of these points is **not** a right endpoint?

(a) $\frac{29}{3}$ (b) $\frac{1}{3}$ (c) 6 (d) 9 (e) 10

Question 3

Suppose we want to compute the Riemann sum of a function $y = f(x)$ on $[4, 12]$ using 40 rectangles, and we wish to use left endpoints as sample points. Which of these points is **not** a left endpoint?

(a) 10.9 (b) 9.8 (c) 6 (d) 7 (e) 10

Question 4

Find an antiderivative of $f(x) = 4x^5 + x^2$.

(a) $20x^4 + 2x$ (b) $\dfrac{2x^6 + x^3 + 2}{3}$ (c) $\dfrac{x^6}{6} + \dfrac{x^3}{3} + 1$

(d) $\dfrac{2x^6}{3} + 2x$ (e) None of the above

Question 5

Suppose the **net area function** for a function f on the interval $[0, 2]$ is $A(x) = x^5 - 6x^2$. Find $f(1)$.

(a) $-\dfrac{5}{6}$ (b) 7 (c) -7 (d) -5 (e) None of the above

Question 6

Find an antiderivative of $f(x) = 2x\cos(x^2)$.

(a) $\cos(x^2)$ (b) $\sin(x^2 + 1)$ (c) $\sin\left(\dfrac{x^3}{3}\right)$

(d) $\sin(x^2) + 23$ (e) None of the above

Question 7

After substituting $u = \cos x$ for the integral

$$\int_0^{\pi} \cos^4 x \cdot (-\sin x)\, dx,$$

what integral in u does it become?

(a) $\displaystyle\int_{-1}^{1} u^4\, du$ (b) $\displaystyle\int_0^{\pi} u^4\, du$ (c) $\displaystyle\int_{\pi}^{0} u^4\, du$

(d) $\displaystyle\int_1^{-1} -u^4\, dx$ (e) None of the above