Practice Assessment

I-U1

1. Explain in words why in the context of area under a curve. You may use an illustration to accompany your text.

$$\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i)\Delta x = \int_a^b f(x)dx$$

I-U2

2. Find $\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i)\Delta x$ for f(x) = $-x^2+5$ over the interval [0,4]

I-U3a

3. Find the left Riemann approximation of $\int_{-4}^{-2}\frac{x^2}{2}+x+1$ using 4 intervals of equal width. Then, determine if this is an over or under approximation and explain how you know.

I-U3b

4. Find the midpoint Riemann approximation of $\int_2^6 \frac{3}{x}dx$ using 4 intervals of equal width.

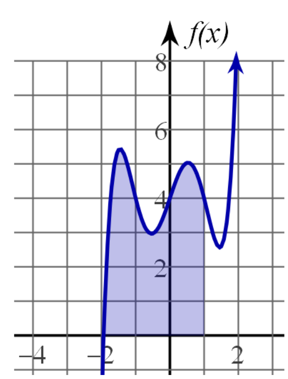
I-U3c

5. Shown below are selected values for a differentiable function f(x). Find the difference in the left and right Riemann approximations of $\int_0^8 f(x)\,dx$ using the intervals indicated by the table.

x	0	2	3	4	5	7	8
$f(x)$	3	4	2	4	2	3	2

I-A4a

6. Find the area of the region bounded by $f(x)=x^5-4x^3+3x+4$, the x-axis, and the lines $x=-2$ and $x=1$.



I-A5

7. $\int_3^4 -\frac{2}{2x-2}dx$

D-AD13

8. Find the interval(s) over which $f(x) = \frac{1}{6}(x^3 + x^2 - x)$ is decreasing and concave down.

I-A2a

9. $2\int e^{\frac{x}{2}} * \cos(e^{\frac{x}{2}})dx$

I-A1b

10. $\int \frac{8x\cos 4x^2}{\sin 4x^2}dx$

I-A2b

11. $\int 5x\sqrt{3x+1}\,dx$

A) $\frac{2}{9}(3x+1)^{\frac{5}{2}} - \frac{10}{27}(3x+1)^{\frac{3}{2}} + C$ B) $\frac{1}{21}(3x+1)^{\frac{7}{3}} - \frac{1}{12}(3x+1)^{\frac{4}{3}} + C$

C) $\frac{2}{21}(3x+1)^{\frac{7}{3}} - \frac{1}{6}(3x+1)^{\frac{4}{3}} + C$ D) $\frac{8}{45}(3x+1)^{\frac{5}{2}} - \frac{8}{27}(3x+1)^{\frac{3}{2}} + C$

I-A3

12. Find y if $\frac{dy}{dx} = 4x + 3$ and $y(-2) = 0$.