Quiz 12 Outline

Format. This quiz will only have multiple choice questions. Here are some examples:

1. Which of the following is the Riemann sum *using right endpoints*, with n rectangles, that approximates the area between $y = x^2$ and the x-axis from $x = 1$ to $x = 4$?

   A. $\displaystyle\sum_{i=1}^{n}\left(4 + (i-1)\cdot\frac{3}{n}\right)^2 \cdot \frac{3}{n}$

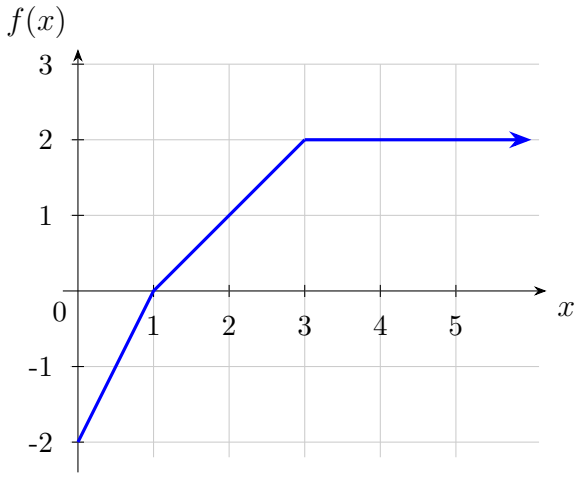
   B. $\displaystyle\sum_{i=1}^{n}\left(4 + i\cdot\frac{3}{n}\right)^2 \cdot \frac{3}{n}$

   C. $\displaystyle\sum_{i=1}^{n}\left(1 + i\cdot\frac{3}{n}\right)^2 \cdot \frac{3}{n}$

   D. $\displaystyle\sum_{i=1}^{n}\left(1 + \left(i-\tfrac{1}{2}\right)\cdot\frac{3}{n}\right)^2 \cdot \frac{3}{n}$

   E. $\displaystyle\sum_{i=1}^{n}\left(1 + (i-1)\cdot\frac{3}{n}\right)^2 \cdot \frac{3}{n}$

2. Use the graph below to answer the following question. Evaluate $\displaystyle\int_0^4 f(x)\,dx$.



   A. 1

   B. 3

   C. 5

   D. 7

   E. Not enough information to determine.

3. Which of the following expresses the limit

$$\lim_{n\to\infty} \sum_{i=1}^{n} \left(1 + \frac{4}{n} i\right)^3 \frac{4}{n}$$

as a definite integral? (You may assume right–hand endpoints are used with $x_i = a + i\Delta x$ and $\Delta x = \dfrac{b-a}{n}$.)

A. $\displaystyle\int_2^6 x^2\,dx$

B. $\displaystyle\int_1^5 (1+x)^3\,dx$

C. $\displaystyle\int_1^5 x^3\,dx$

D. $\displaystyle\int_1^5 (1+x^3)\,dx$

E. None of the above

4. Use integral properties to write

$$\int_{-3}^{4} f(x)\,dx \;+\; \int_{4}^{7} f(x)\,dx \;-\; \int_{-3}^{-1} f(x)\,dx$$

as a single integral $\displaystyle\int_a^b f(x)\,dx$.

A. $\displaystyle\int_{-3}^{4} f(x)\,dx$

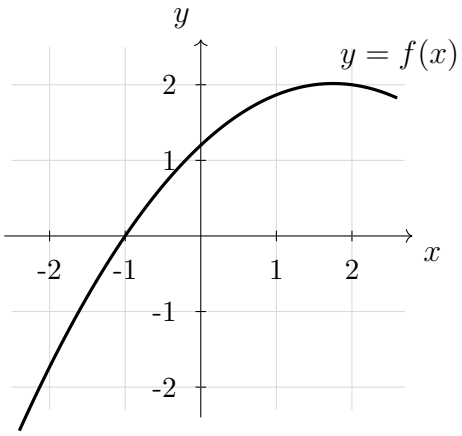
B. $\displaystyle\int_{-1}^{4} f(x)\,dx$

C. $\displaystyle\int_{-3}^{7} f(x)\,dx$

D. $\displaystyle\int_{-1}^{7} f(x)\,dx$

E. $\displaystyle\int_{-1}^{-3} f(x)\,dx$

5. Below is a graph of $f(x)$. Let A be the area under the curve $y = f(x)$ from $x = -1$ to $x = 1$. We approximate A by four rectangles. Let L_4 be the approximation using left endpoints and R_4 the approximation using right endpoints. Rank A, L_4, and R_4 from smallest to largest.



A. $R_4 < A < L_4$

B. $L_4 < A < R_4$

C. $R_4 < L_4 < A$

D. $L_4 < R_4 < A$

E. $A < L_4 < R_4$

Answers: C, B, C, D, B