

SCORE: 4 / 10 POINTS

What month is your birthday ?
What are the first 2 digits of your address ?
What are the last 2 digits of your zip code ?
What are the last 2 digits of your social security number ?
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER,
USE YOUR STUDENT ID NUMBER]

Compute the sum, AND the limit of the sum as $n \rightarrow \infty$.

SCORE: 1 / 3 POINTS

$$\begin{aligned} &\sum_{i=1}^n \frac{1}{n} \left[4 \left(\frac{i}{n} \right) + 3 \left(\frac{i}{n} \right)^2 \right] \\ &= \frac{1}{n^2} \sum_{i=1}^n \left[4i + 3 \left(\frac{i^2}{n} \right) \right] \\ &= \frac{1}{n^2} \left[\sum_{i=1}^n 4i + \sum_{i=1}^n 3 \left(\frac{i^2}{n} \right) \right] \\ &= \frac{1}{n^2} \left[4 \sum_{i=1}^n i + 3 \sum_{i=1}^n \frac{i^2}{n} \right] \end{aligned}$$
$$\begin{aligned} &= \frac{1}{n^3} \left[4n \sum_{i=1}^n i + 3 \sum_{i=1}^n i^2 \right] \\ &= \frac{1}{n^3} [\dots] \end{aligned}$$

Compute the sum of the form $\sum_{i=1}^n f(x_i) \Delta x$ if

SCORE: 2 / 6 POINTS

$f(x) = 4x^2 + 2, \quad x = 2.1, 2.2, 2.3, \dots, 3.0, \quad \Delta x = 0.1, \quad n = 10$

Use the rules and shortcuts of summation, and show your work. DO NOT SIMPLY ADD A LIST OF NUMBERS.

$\sum_{i=1}^n f(x_i) \Delta x \quad \Delta x = 0.1 \quad n = 10$

$f(x) = 4x^2$

$x = 2.1, 2.2, 2.3, \dots, 3.0$

$$\begin{aligned} &\sum_{i=1}^{10} 4x_i^2 \cdot 0.1 \\ &= \sum_{i=1}^{10} .4 x_i^2 \\ &= .4 \sum_{i=1}^{10} x_i^2 \\ &= .4 \left(\frac{1}{6} (10)(10+1)(2(10)+1) \right) \\ &= .4 \left(\frac{2310}{6} \right) \\ &= \frac{9240}{6} \\ &= 1540 \end{aligned}$$
$$\begin{aligned} &\sum_{i=1}^{10} \left(2 + \frac{x_i}{10} \right) \cdot .1 \\ &= \sum_{i=1}^{10} \left(.2 + \frac{x_i}{100} \right) \\ &= \sum_{i=1}^{10} .2 + \frac{1}{100} \sum_{i=1}^{10} x_i \\ &= 2 + \frac{10(2.1+3.0)}{2} \\ &= 2 + \frac{51}{2} \\ &= 27.5 \end{aligned}$$

[MULTIPLE CHOICE] Given that $\sum_{i=1}^n i^3 = \frac{n^2(n+1)^2}{4}$, find the value of $\sum_{i=1}^{20} (3+2i-i^3)$.

SCORE: 1 / 1 POINT

- [a] -43680 [b] -43620 [c] -43430 [d] -43470

LETTER OF CORRECT ANSWER: [b]