

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: 3 / 3 POINTS

$$\begin{aligned}
 \sum_{i=1}^n \frac{1}{n} \left[6 \left(\frac{i}{n} \right) - 3 \left(\frac{i}{n} \right)^2 \right] &\Rightarrow \frac{6}{n^2} \sum_{i=1}^n i - \frac{3}{n^3} \sum_{i=1}^n i^2 \\
 &= \frac{36}{n^2} \cdot \frac{n(n+1)}{2} - \frac{3}{n^3} \cdot \frac{n(n+1)(2n+1)}{6} \\
 &= \frac{3(n+1)}{n} - \frac{(n+1)(2n+1)}{2n^2} \\
 &= \frac{6n^2(n+1) - (n+1)(2n+1)n}{2n^3} = \frac{4n^3 + 3n^2 - 2n^3 - 2n^2 - n}{2n^3} \\
 \lim_{n \rightarrow \infty} &= \frac{4n^3 + 3n^2 - n}{2n^3} ; \Rightarrow \text{Using The shortcut} \Rightarrow \frac{4}{2} = \underline{\underline{2}}
 \end{aligned}$$

Compute the sum of the form $\sum_{i=1}^n f(x_i) \Delta x$ ifSCORE: 6 / 6 POINTS

$$f(x) = 4x^2 + 3, \quad x = 2.1, 2.2, 2.3, \dots, 3.0, \quad \Delta x = 0.1, \quad n = 10$$

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

$$\begin{aligned}
 x &\geq 2.0 + 0.1, 2.0 + 0.2, \dots, 2.0 + 1.0 \\
 &= 2.0 + 0.1i, \quad i = 1, \dots, 10 \\
 \Rightarrow \sum_{i=1}^{10} [4(2.0 + 0.1i)^2 + 3] 0.1 &\Rightarrow 0.4 \sum_{i=1}^{10} (2.0 + 0.1i)^2 + 0.3 \sum_{i=1}^{10} 1 \\
 &\Rightarrow 0.4 \sum_{i=1}^{10} (4.0 + 0.4i + 0.01i^2) + 0.3(10) \\
 &\Rightarrow 0.4 \sum_{i=1}^{10} 4 + 0.4 \sum_{i=1}^{10} 0.01i^2 + 0.4 \sum_{i=1}^{10} 0.4i + 3.0 \\
 &\Rightarrow 0.4 \times 4 \times 10 + (0.4 \times 0.01) \times \frac{5 \times 11 \times 7}{6} + 0.4 \times 0.4 \times \frac{5 \times 11}{2} + 3.0 \\
 &\Rightarrow 16 + 1.54 + 8.8 + 3.0 \Rightarrow \underline{\underline{29.34}}
 \end{aligned}$$

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

[a] -43680

[b] -43620

[c] -43430

[d] -43470

LETTER OF CORRECT ANSWER: [c]