

$$\begin{aligned}
 & \int_0^5 (x^2 + 7x) dx \\
 & \Delta x = \frac{5-0}{n} \\
 & x_k = 0 + k\Delta x = \frac{5k}{n} \\
 & \Delta x \sum_{k=1}^n f(x_k) = \frac{5}{n} \sum_{k=1}^n \left(\left(\frac{5k}{n} \right)^2 + 7 \left(\frac{5k}{n} \right) \right) \\
 & = \frac{5}{n} \sum_{k=1}^n \left(\frac{25k^2}{n^2} + \frac{35k}{n} \right) = \frac{5}{n} \cdot \frac{25}{n^2} \sum_{k=1}^n k^2 + \frac{5}{n} \cdot \frac{35}{n} \sum_{k=1}^n k \\
 & = \frac{125}{n^3} \left(\frac{n^3 + n}{3} \right) + \frac{185}{n^2} \left(\frac{n^2 + n}{2} \right) \\
 & \xrightarrow{n \rightarrow \infty} \frac{125}{3} + \frac{185}{2} = \frac{250 + 555}{6} = \boxed{\frac{805}{6}}
 \end{aligned}$$