

Mechanics Based Problems

1. Write the following sum in expanded form, then compute the sum:

$$\sum_{i=4}^6 3^i$$

$$\underline{\underline{1053}} \text{ ANS}$$

2. Write the following sum in expanded form, then compute the sum:

$$\sum_{i=1}^8 (3i - 2)$$

$$\underline{\underline{80}} \text{ ANS}$$

3. Write the following sum in expanded form:

$$\sum_{i=1}^4 f(x_i) \Delta x$$

$$\underline{\underline{f(x_1) \Delta x + f(x_2) \Delta x + f(x_3) \Delta x + f(x_4) \Delta x}}$$

ANS

4. Write the following sum in expanded form:

$$\sum_{i=1}^4 f(x_{i-1}) \Delta x$$

$$\underline{f(x_0) \Delta x + f(x_1) \Delta x + f(x_2) \Delta x + f(x_3) \Delta x} \quad \text{ANS}$$

5. Write the following sum in expanded form:

$$\sum_{i=1}^4 f\left(\frac{x_{i-1} + x_i}{2}\right) \Delta x$$

$$\underline{f\left(\frac{x_0 + x_1}{2}\right) \Delta x + f\left(\frac{x_1 + x_2}{2}\right) \Delta x + f\left(\frac{x_2 + x_3}{2}\right) \Delta x + f\left(\frac{x_3 + x_4}{2}\right) \Delta x} \quad \text{ANS}$$

6. Write the following sums using \sum notation:

(a) $f(x_0)\Delta x + f(x_1)\Delta x + f(x_2)\Delta x$

$$\underline{\underline{\sum_{i=1}^3 f(x_{i-1}) \Delta x}} \quad \text{ANS}$$

(b) $f(x_1)\Delta x + f(x_2)\Delta x + f(x_3)\Delta x + f(x_4)\Delta x$

$$\underline{\underline{\sum_{i=1}^4 f(x_i) \Delta x}} \quad \text{ANS}$$