

# MAT2440, Quiz6, Spring2025

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Name: Sol

1. Find the first four term  $a_0, a_1, a_2, a_3$  of the given sequence

Sol

$$a_n = n^3 + \frac{2}{n+1}$$

$$a_0 = 0^3 + \frac{2}{0+1} = 0 + 2 = 2$$

$$a_1 = 1^3 + \frac{2}{1+1} = 1 + \frac{2}{2} = 1 + 1 = 2$$

$$a_2 = 2^3 + \frac{2}{2+1} = 8 + \frac{2}{3} = \frac{26}{3}$$

$$a_3 = 3^3 + \frac{2}{3+1} = 27 + \frac{2}{4} = \frac{55}{2}$$

2. Find the value of the sum

Sol

$$\sum_{i=1}^3 \sum_{j=0}^4 (i + (-2)^j)$$

$$\begin{aligned} & \sum_{i=1}^3 \left( \underbrace{i + (-2)^0}_{j=0} + \underbrace{i + (-2)^1}_{j=1} + \underbrace{i + (-2)^2}_{j=2} + \underbrace{i + (-2)^3}_{j=3} + \underbrace{i + (-2)^4}_{j=4} \right) \\ &= \sum_{i=1}^3 \left( 5i + (-2)^0 + (-2)^1 + (-2)^2 + (-2)^3 + (-2)^4 \right) \\ &= \sum_{i=1}^3 (5i + 1 - 2 + 4 - 8 + 16) \\ &= \sum_{i=1}^3 (5i + 11) = \underbrace{5 \cdot 1 + 11}_{i=1} + \underbrace{5 \cdot 2 + 11}_{i=2} + \underbrace{5 \cdot 3 + 11}_{i=3} \\ &= \underline{5} + \underline{11} + \underline{10} + \underline{11} + \underline{15} + \underline{11} \\ &= 30 + 33 = 63 \end{aligned}$$