

# Discrete Assignment

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EE23BTECH11030

- 1) **Question 11.9.4.9:** Find the sum to  $n$  terms of the series whose  $n$ th term is given by  $n^2 + 2^n$ ?  
**Solution:**

$$y(n) = \sum_{k=1}^n x(k)$$

$$y(n) = \sum_{k=1}^n (5 - 2k)$$

$$Y(z) = \sum_{n=0}^{\infty} y(n)z^{-n}$$

$$Y(z) = \sum_{n=0}^{\infty} \left( \sum_{k=1}^n (5 - 2k) \right) z^{-n}$$

$$Y(z) = \sum_{k=1}^{\infty} \sum_{n=k}^{\infty} (5 - 2k) z^{-n}$$

$$Y(z) = \sum_{k=1}^{\infty} (5 - 2k) \sum_{n=k}^{\infty} z^{-n}$$

$$Y(z) = \sum_{k=1}^{\infty} (5 - 2k) \frac{z^{-k}}{1 - z^{-1}}$$

$x(n) = a^n$  has the Z-transform  $\frac{1}{1 - az^{-1}}$ .

However, the expression we have is not a simple geometric series, so the process to find the Z-transform of  $y(n)$  might not yield a simple closed-form expression without further manipulation.