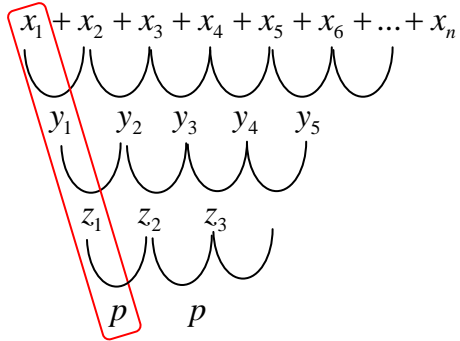


## **Barisan dan Deret – Bader Bertingkat 3**

Misalkan deret  $x_1 + x_2 + x_3 + x_4 + \dots + x_n$  dimana  $y_k = x_{k+1} - x_k$ ,  $z_k = y_{k+1} - y_k$  dan  $p = z_{k+1} - z_k$ .



$$U_n = an^3 + bn^2 + cn + d$$

$$\begin{aligned} \Rightarrow x_1 &= a + b + c + d \quad \dots(1) \\ x_2 &= 8a + 4b + 2c + d \quad \dots(2) \\ x_3 &= 27a + 9b + 3c + d \quad \dots(3) \\ x_4 &= 64a + 16b + 4c + d \quad \dots(4) \end{aligned} \left\{ \begin{aligned} (2) - (1) : y_1 &= 7a + 3b + c \quad \dots(5) \\ (3) - (2) : y_2 &= 19a + 5b + c \quad \dots(6) \\ (4) - (3) : y_3 &= 37a + 7b + c \quad \dots(7) \end{aligned} \right.$$

$$\begin{aligned} \Rightarrow (6) - (5) : z_1 &= 12a + 2b \quad \dots(8) \\ (7) - (6) : z_2 &= 18a + 2b \quad \dots(9) \end{aligned} \left\{ \begin{aligned} (9) - (8) : p &= 6a \Rightarrow a = \frac{p}{6} \end{aligned} \right.$$

$$\otimes z_1 = 12a + 2b \quad \Rightarrow b = \frac{z_1 - 12a}{2} \quad \Rightarrow b = \frac{z_1}{2} - p$$

$$\otimes y_1 = 7a + 3b + c \quad \Rightarrow c = y_1 - 3b - 7a \Rightarrow c = y_1 - 3\left(\frac{z_1}{2} - p\right) - \frac{7p}{6} \Rightarrow c = y_1 - \frac{3}{2}z_1 + \frac{11}{6}p$$

$$\begin{aligned} \otimes x_1 &= a + b + c + d \Rightarrow d = x_1 - a - b - c \Rightarrow d = x_1 - \frac{p}{6} - \left(\frac{z_1}{2} - p\right) - \left(y_1 - \frac{3}{2}z_1 + \frac{11}{6}p\right) \\ &\Rightarrow d = x_1 - y_1 + z_1 - p \end{aligned}$$

$$U_n = an^3 + bn^2 + cn + d$$

$$= \frac{p}{6}n^3 + \left(\frac{1}{2}z_1 - p\right)n^2 + \left(y_1 - \frac{3}{2}z_1 + \frac{11}{6}p\right)n + (x_1 - y_1 + z_1 - p)$$

Contoh soal:

$$10 + 26 + 58 + 112 + 194 + \dots + 922$$

The diagram illustrates the sequence  $10 + 26 + 58 + 112 + 194 + \dots + 922$ . The first term, 10, is circled in red. Below the terms, the first differences are shown as 16, 32, 54, 82, and the second differences as 16, 22, 28.

$$\begin{aligned}
 U_n &= \frac{p}{6} n^3 + \left( \frac{1}{2} z_1 - p \right) n^2 + \left( y_1 - \frac{3}{2} z_1 + \frac{11}{6} p \right) n + (x_1 - y_1 + z_1 - p) \\
 &= \frac{6}{6} n^3 + \left( \frac{1}{2} 16 - 6 \right) n^2 + \left( 16 - \frac{3}{2} 16 + \frac{11}{6} 6 \right) n + (10 - 16 + 16 - 6) \\
 &= n^3 + 2n^2 + 3n + 4
 \end{aligned}$$

Catatan:

- Bab Terkait: Notasi Sigma, Induksi Matematika.
- Ada kalanya menggunakan SPLEV lebih mudah daripada dengan rumus di atas. Do you?