

CONTOH SOAL NOTASI SIGMA

1. Ubahlah $\sum_{k=0}^5 (4k+3)$ menjadi bentuk sigma dengan batas bawah 7!

Jawaban:

$$\sum_{k=0}^5 (4k+3) = \sum_{k=7}^{5+7} 4(k-7)+3 = \sum_{k=7}^{12} (4k-25)$$

2. Nilai dari :

$$\sum_{n=2}^{21} (5n-6) = \dots$$

Jawaban:

$$\begin{aligned} \sum_{n=2}^{21} (5n-6) &= (5 \cdot 2 - 6) + (5 \cdot 3 - 6) + (5 \cdot 4 - 6) + \dots + (5 \cdot 21 - 6) \\ &= 4 + 9 + 14 + \dots + 99 \end{aligned}$$

$$a = 4$$

$$b = 9 - 4 = 14 - 9 = 5$$

$$n = n(\text{akhir}) - (n(\text{awal}) - 1) = 21 - (2 - 1) = 20$$

$$\begin{aligned} S_n &= \frac{n}{2} (a + U_n) = \frac{n}{2} (2a + (n-1)b) \\ &= \frac{20}{2} (2 \cdot 4 + (20-1)5) = 10 (8 + 95) \\ &= 10 \cdot 103 = 1030 \end{aligned}$$

3. Diketahui :

$$\sum_{k=5}^{25} (2 - pk) = 0, \text{ maka nilai } \sum_{k=5}^{25} pk = \dots$$

Jawaban:

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$$\sum_{k=5}^{25} (2 - pk) = 0$$

$$\sum_{k=5}^{25} (2 - pk) = \sum_{k=5}^{25} 2 - \sum_{k=5}^{25} pk = 0$$

$$\sum_{k=5}^{25} 2 = \sum_{k=5}^{25} pk$$

$$2(n(\text{akhir}) - (n(\text{awal}) - 1)) = \sum_{k=5}^{25} pk$$

$$2(25 - (5 - 1)) = \sum_{k=5}^{25} pk$$

$$2 \cdot 21 = \sum_{k=5}^{25} pk \rightarrow \sum_{k=5}^{25} pk = 42$$

jawabannya adalah D

Catatan :

$$\sum_{k=5}^{25} 2 = \underbrace{2 + 2 + 2 + \dots + 2}_{n \text{ kali}} = 2 \cdot 21 = 42$$

$$n = 25 - (5 - 1) = 21 \text{ kali}$$

4. Suku keempat dan suku ketujuh barisan aritmetika berturut-turut adalah 17 dan 29. Suku ke 25 barisan tersebut adalah....

Jawaban:

$$U_4 = 17 = a + (n-1)b = a + 3b \quad \dots(1)$$

$$U_7 = 29 = a + (n-1)b = a + 6b \quad \dots(2)$$

Dari (1) dan (2)

$$a + 3b = 17$$

$$a + 6b = 29 \quad -$$

$$-3b = -12$$

$$b = 4$$

$$a + 3b = 17$$

$$a = 17 - 3b$$

$$= 17 - 3 \cdot 4$$

$$= 17 - 12 = 5$$

$$U_{25} = a + (25 - 1)b$$

$$= 5 + 24 \cdot 4 = 5 + 96 = 101$$

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5. Suatu deret aritmetika, diketahui jumlah 5 suku yang pertama = 35 dan jumlah 4 suku yang pertama = 24, suku yang ke 15 =

Jawaban:

$$S_5 = \frac{n}{2}(2a + (n-1)b) = \frac{5}{2}(2a + 4b) = 5a + 10b = 35 \dots (1)$$

$$S_4 = \frac{4}{2}(2a + 3b) = 4a + 6b = 24 \dots (2)$$

dari (1) dan (2)

$$\begin{array}{rcl} 5a + 10b = 35 & | \times 4 | & \Rightarrow 20a + 40b = 140 \\ 4a + 6b = 24 & | \times 5 | & \Rightarrow 20a + 30b = 120 \quad - \\ \hline & & 10b = 20 \\ & & b = 2 \end{array}$$

$$\begin{array}{rcl} 5a + 10b & = & 35 \\ 5a & = & 35 - 10b \\ 5a & = & 35 - 20 \\ a & = & 15/5 = 3 \end{array}$$

$$\begin{aligned} U_{15} &= a + (15 - 1)b \\ &= 3 + 14 \cdot 2 = 3 + 28 = 31 \end{aligned}$$