

Nama :

Kelas :

LKPD

Deret Aritmatika

Rumus Deret Aritmatika

$$S_n = \frac{1}{2}n(a + Un)$$

Dalam barisan aritmatika, rumus deret aritmatika

$$S_n = \frac{1}{2}n(2a + (n - 1)b)$$

Kerjakan soal berikut ini.

1. Ditentukan deret aritmetika:

$6 + 10 + 14 + \dots$ Carilah:

- rumus suku ke- n ,
 - rumus jumlah n suku pertama, dan
 - jumlah 30 suku pertama.
2. Diketahui deret aritmetika 15 suku. Jumlah lima suku pertama adalah 60 dan jumlah dua suku terakhir adalah 139. Tentukan jumlah semua suku deret itu.

Penyelesaian:

1. Diketahui: $a = \dots$

$$b = \dots - \dots = \dots$$

Ditanya: a. $U_n = \dots?$

b. $S_n = \dots?$

c. $S_{30} = \dots?$

Jawab:

$$\begin{aligned} \text{a. } U_n &= a + (n - 1)b \\ &= \dots + (n - 1) \dots \\ &= \dots + \dots n - \dots \\ &= \dots n + \dots \end{aligned}$$

Jadi, rumus suku ke- n adalah $U_n = \dots n + \dots$

$$\begin{aligned}
 \text{b. } S_n &= \frac{n}{2}(a + U_n) \\
 &= \frac{n}{2}(\dots\dots + \dots\dots n + \dots\dots) \\
 &= \frac{n}{2}(\dots\dots n + \dots\dots) \\
 &= \dots\dots n^2 + \dots\dots n
 \end{aligned}$$

Jadi, rumus jumlah n suku pertama adalah $S_n = \dots\dots n^2 + \dots\dots n$

$$\begin{aligned}
 \text{c. } S_n &= \dots\dots n^2 + \dots\dots n \\
 S_{30} &= \dots\dots (30)^2 + \dots\dots (30) \\
 &= \dots\dots (\dots\dots) + \dots\dots \\
 &= \dots\dots + \dots\dots \\
 &= \dots\dots
 \end{aligned}$$

Jadi, jumlah 30 suku pertama adalah $\dots\dots$

2. Diketahui: $S_5 = \dots\dots$

$$U_{14} + U_{15} = \dots\dots$$

Ditanya: $S_{15} = \dots\dots?$

$$\text{Jawab: } S_n = \frac{n}{2}(2a + (n - 1)b)$$

$$S_5 = \dots\dots$$

$$\Leftrightarrow \frac{5}{2}(2a + (\dots\dots - 1)b) = \dots\dots$$

$$\Leftrightarrow \frac{5}{2}(2a + \dots\dots b) = \dots\dots$$

$$\Leftrightarrow \dots\dots a + \dots\dots b = \dots\dots$$

$$\Leftrightarrow a + \dots\dots b = \dots\dots \quad \dots\dots \text{persamaan (1)}$$

$$U_{14} + U_{15} = \dots\dots$$

$$\leftrightarrow (a + \dots\dots b) + (a + \dots\dots b) = \dots\dots$$

$$\leftrightarrow 2a + \dots\dots b = \dots\dots \quad \dots\dots \text{persamaan (2)}$$

Eliminasi a dari persamaan (1) dan (2)

$$\begin{array}{r|l|l} a + \dots\dots b = \dots\dots & \times 2 & 2a + \dots\dots b = \dots\dots \\ 2a + \dots\dots b = \dots\dots & \times 1 & 2a + \dots\dots b = \dots\dots \\ \hline & & \dots\dots b = \dots\dots \\ & & \leftrightarrow b = \dots\dots \end{array}$$

Substitusi $b = \dots\dots$ ke persamaan (1)

$$a + \dots\dots b = \dots\dots$$

$$\leftrightarrow a + \dots\dots = \dots\dots$$

$$\leftrightarrow a = \dots\dots - \dots\dots$$

$$\leftrightarrow a = \dots\dots$$

$$S_n = \frac{n}{2}(2a + (n - 1)b)$$

$$S_{15} = \frac{15}{2}(2(\dots\dots) + (\dots\dots - 1)\dots\dots)$$

$$= \frac{15}{2}(\dots\dots + \dots\dots (\dots\dots))$$

$$= \frac{15}{2}(\dots\dots + \dots\dots)$$

$$= \frac{15}{2}(\dots\dots)$$

$$= \dots\dots$$

Jadi, jumlah semua suku deret tersebut adalah $\dots\dots$