

Deret dan Barisan Bilangan

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* Deret Aritmatika

$$u_1 = a$$

Suku srg = suku sebelum + beda

$$\underline{u_n} = \underline{u_{n-1}} + b$$

$$u_n = u_{n-2} + \underbrace{b + b}_2$$

$$u_n = u_{n-3} + \underbrace{b + b + b}_3$$

$$u_n = u_1 + \underbrace{b + b + \dots + b}_{n-1}$$

$u_n - (n-1)b$

$$u_{n-1} = u_{n-2} + b$$

$$u_{n-k} = u_1$$

$$n-k = 1$$

$$k = n-1$$

$$2 + 2 + 2 = 2$$

$$U_n = U_1 + (n-1)b = a + (n-1)b$$

* Deret geometri

suku n th = suku sebelum * ratio

$$\begin{aligned} U_n &= U_{n-1} * r \\ U_n &= U_{n-2} * r * r \\ U_n &= U_{n-3} * r * r * r \\ &\vdots \end{aligned}$$

$$U_n = U_1 * r * \underbrace{r * \dots * r}_{(n-1)} \\ \downarrow \\ a - (n-1)$$

$$U_n = ar^{n-1}$$

$$S_n = \frac{a(1-r^n)}{1-r}, \quad r < 1 \Rightarrow a/b$$

: $a < b$

$$32, 16, 8, \dots$$

$\underbrace{\hspace{1.5cm}}$

$$1/2$$

$$< 1$$

$$S_n = \frac{a(r^n - 1)}{r - 1}$$

$$r > 1, \quad a/b$$
$$a > b$$

$$r \neq 1$$

$$S_\infty = \frac{a}{1 - r}$$

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do{
  res = a
}while(a /= r)
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a = 286

r = 3

Nilai akhir res = ... ?

286.

$u_n \Rightarrow 1$

$ar^n \Rightarrow 1$

$286 \left(\frac{1}{3} \right)^n = 1$

$\left(\frac{1}{3} \right)^n = \frac{1}{286}$

$\frac{1}{3^n} = \frac{1}{286}$ $286 = 3^n$

$$n \approx {}_3 \log 286$$

$$n \approx 5$$

$$S_5 = \frac{a(1-r^n)}{1-r} = \frac{286(1-(\frac{1}{3})^5)}{1-\frac{1}{3}}$$

$$= \frac{286 - \frac{286}{243}}{\frac{2}{3}}$$

$$= \frac{\cancel{286} * \cancel{243} - \cancel{286}}{\cancel{243} * \cancel{2}}$$

$$= \frac{143 * 243 - 143}{1}$$

$$= 1$$

$$= \underline{\underline{426}}$$

