PENYELESAIAN TUGAS 6

10) $a_k = ka_{k-1}, k \geq 1,\ a_0 = 1.$

Penyelesaian :

$a_1 = 1.a_0 = 1.1 = 1$

$a_2 = 2a_1 = 2.1$

$a_3 = 3a_2 = 3.2.1$

$a_4 = 4a_3 = 4.3.2.1$

dst.

Berdasar pola di atas terlihat bahwa

$a_k = k(k-1)(k-2)\ldots 2.1 = k!$

11) $b_k = 3b_{k-1} + 1,\ k \geq 2,\ b_1 = 1$

Penyelesaian :

$b_2 = 3b_1 + 1 = 3.1 + 1$

$b_3 = 3b_2 + 1 = 3(3.1 + 1) + 1 = 3.3 + 3.1 + 1 = 3^2 + 3 + 1$

$b_4 = 3b_3 + 1 = 3(3^2 + 3 + 1) + 1 = 3^3 + 3^2 + 3 + 1$

$b_5 = 3b_4 + 1 = 3(3^3 + 3^2 + 3 + 1) + 1 = 3^4 + 3^3 + 3^2 + 3 + 1$

dst.

Berdasar pola di atas terlihat bahwa

$a_k = 3^{k-1} + \cdots + 3^4 + 3^3 + 3^2 + 3 + 1 = \frac{3^k-1}{3-1} = \frac{3^k-1}{2}$.

12) $d_k = d_{k-1} + 2k, k \geq 1,\ d_0 = 3.$

Penyelesaian :

$d_1 = d_0 + 2k = 3 + 2.1$

$d_2 = d_1 + 2.2 = 3 + 2.1 + 2.2$

$d_3 = d_2 + 2.3 = 3 + 2.1 + 2.2 + 2.3$

$d_4 = d_3 + 2.4 = 3 + 2.1 + 2.2 + 2.3 + 2.4$

dst.

Berdasar pola di atas terlihat bahwa

$$d_k = 3 + 2.1 + 2.2 + 2.3 + \cdots + 2.k = 3 + 2(1 + 2 + 3 + \cdots + k) = 3 + 2\frac{k(k+1)}{2}$$
$$= 3 + k(k+1) = k^2 + k + 3.$$

13) $u_k = u_{k-1} + k^2,\ k \geq 2,\ u_1 = 1$

Penyelesaian :

$u_2 = u_1 + 2^2 = 1 + 2^2$

$u_3 = u_2 + 3^2 = 1 + 2^2 + 3^2$

$u_4 = u_3 + 4^2 = 1 + 2^2 + 3^2 + 4^2$

$u_5 = u_4 + 5^2 = 1 + 2^2 + 3^2 + 4^2 + 5^2$

dst.

Berdasar pola di atas terlihat bahwa

$$u_k = 1 + 2^2 + 3^2 + \cdots + k^2 = \frac{k(k+1)(2k+1)}{6}.$$

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