

HW: Turn in Weds

$$1. \quad s_0 = 7 \quad s_n = 4s_{n-1} - 2$$

$$2. \quad t_0 = 3 \quad t_n = t_{n-1} + 5n$$

$$e_1 = 0$$

$$e_n = e_{(n-1)} + (n-1)$$

$$1 + 2 + \dots + (n-1) = S$$

$$n-1 + n-2 + \dots + 2 + 1 = S$$

n	e_n
1	0
2	$0 + (2-1)$
3	$(0 + (2-1)) + (3-1)$
4	$(0 + (2-1)) + (3-1) + (4-1)$
5	$0 + (2-1) + (3-1) + (4-1) + (5-1) =$
	$0 + 1 + 2 + 3 + 4 =$
	$0 + 2 + 3 + 4 + 5 - (1+1+1+1)$
n	$1 + 2 + 3 + \dots + (n-1) = \frac{n(n-1)}{2}$
	$2 + 3 + 4 + \dots + n - (1+1+\dots+1)$
	$n-1 \text{ of these}$

$$n(n-1) = n + n + \dots + n = 2S$$

$$\frac{n(n-1)}{2} = S$$

$$u_0 = 3$$

$$u_n = u_{n-1} + 4n$$

n	u_n
0	3
1	$3 + 4$
2	$3 + 4 + 4 \cdot 2$
3	$3 + 4 + 4 \cdot 2 + 4 \cdot 3$
4	$3 + 4 + 4 \cdot 2 + 4 \cdot 3 + 4 \cdot 4$ $= 3 + 4(1 + 2 + 3 + 4)$
5	$3 + 4(1 + 2 + 3 + 4 + 5)$
n	$3 + 4(1 + 2 + 3 + \dots + n)$ $= 3 + 4 \frac{n(n+1)}{2}$ $= 3 + 2n(n+1)$

$$t_0 = 2$$

$$t_n = 6t + 3$$

n	t_n
0	2
1	$6 \cdot 2 + 3$
2	$6(6 \cdot 2 + 3) + 3 = 6 \cdot 6 \cdot 2 + 6 \cdot 3 + 3$
3	$6(6(6 \cdot 2 + 3) + 3) + 3 = 6 \cdot 6 \cdot 6 \cdot 2 + 6 \cdot 6 \cdot 3 + 6 \cdot 3 + 3$ $= 6^3 \cdot 2 + 6^2 \cdot 3 + 6 \cdot 3 + 3$
4	$6^4 \cdot 2 + 6^3 \cdot 3 + 6^2 \cdot 3 + 6 \cdot 3 + 3 = 6^4 \cdot 2 + (6^3 + 6^2 + 6 + 1) \cdot 3$
5	$6^5 \cdot 2 + (6^4 + 6^3 + 6^2 + 6 + 1) \cdot 3$
n	$6^n \cdot 2 + (6^{n-1} + 6^{n-2} + \dots + 6 + 1) \cdot 3$ $= 2 \cdot 6^n + 3 \left(\frac{6^n - 1}{6 - 1} \right)$ $= 2 \cdot 6^n + \frac{3(6^n - 1)}{5}$

$$S_0 = 2$$

$$S_n = -S_{n-1} + 3$$

n	S_n
0	2
1	$-2 + 3$
2	$-(-2 + 3) + 3 = 2 - 3 + 3$
3	$-(-(-2 + 3) + 3) + 3 = -2 + 3 - 3 + 3$
4	$2 - 3 + 3 - 3 + 3$

$$n \begin{cases} -2 + 3 \\ 2 + 0 \end{cases}$$

n is odd

n is even



$$\text{or } n = (-1)^n \cdot 2 + 3 \left(\frac{(-1)^{n-1}}{-2} \right)$$