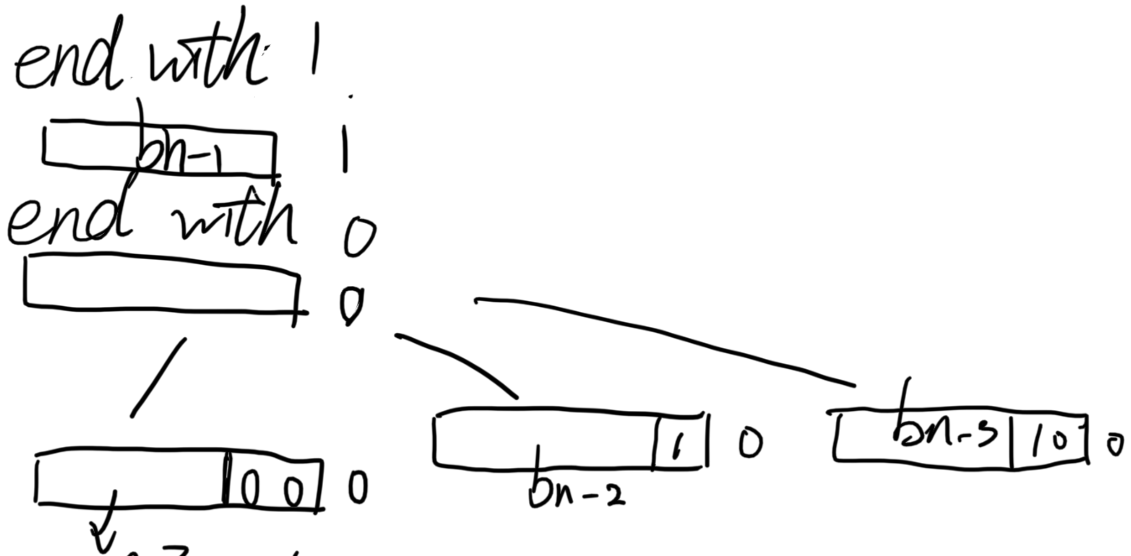
8.1 ex.8



$2^{n-3} - b_{n-3}$

a) $\boxed{b_n = 2^{n-3} + b_{n-2} + b_{n-1}}$

for $n \geq 3$

b) initial conditions
$b_1 = 0$
$b_2 = 0$

$b_3 = 2^0 + 0 + 0 = 1$

$b_4 = 2^1 + 0 + 1 = 3$

$b_5 = 2^2 + 1 + 3 = 8$

$b_6 = 2^3 + 3 + 8 = 19$

c) $\boxed{b_7 = 2^4 + 19 + 8 = 43}$

8.2. ex. 2

$$\boxed{\begin{array}{l} \text{a. degree } \cancel{1}\ 2 \\ \text{d. degree } 3. \\ \text{g degree } 7 \end{array}}$$

ex.4. c. $r^2 - 6r + 8 = 0$

$\begin{matrix} -2 \\ -4 \end{matrix}$

$r_1 = 2 \quad r_2 = 4.$

$a_n = \alpha_1 \cdot 2^n + \alpha_2 \cdot 4^n$

$a_0 = 4 = \alpha_1 + \alpha_2$

$a_1 = 10 = 2\alpha_1 + 4\alpha_2$

$\begin{cases} \alpha_2 = 1 \\ \alpha_1 = 3 \end{cases}$

$$\boxed{a_n = 3 \times 2^n + 4^n}$$

d. $r^2 - 2r + 1 = 0 \quad r_1 = r_2 = 1$

$a_n = \alpha_1 \cdot 1^n + \alpha_2 \cdot n \cdot 1^n$

$a_0 = 4 = \alpha_1$

$a_1 = 1 = \alpha_1 + \alpha_2$

$\{ \alpha_1 = 4$

$1\alpha_2 = -3$

$\boxed{\therefore a_n = 4 - 3n}$

22. $m_{-1} = 3 \quad m_2 = 2 \quad m_5 = 2$

so the general from

$(a_{1,0} + a_{1,1} \times n + a_{1,2} n^2)(-1)^n$

$+ (a_{2,0} + a_{2,1} n) \cdot 2^n + (a_{3,0} + a_{3,1}) \cdot 5^n$

$+ a_{4,0} \cdot 7^n$

24. a) left $\boxed{n \cdot 2^n}$

right $= 2 \times (n-1) \cdot 2^{n-1} + 2^n$

$= 2^n (n-1) + 2^n$

$\boxed{= 2^n \cdot n}$

b) homogeneous linear recurrence form

$a_n = 2a_{n-1}$

$r - 2 = 0 \quad r = 2$

$a_n^{(h)} = \alpha \cdot 2^n$ we have $a_n^{(p)} = n \cdot 2$

$\boxed{a_n = a_n^{(h)} + a_n^{(p)} = \alpha \cdot 2^n + n \cdot 2^n}$

c)

( )

$a_0 = 2 = \alpha$

$$\boxed{\therefore a_n = 2^{n+1} + n \cdot 2^n}$$