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HW # 1

1) $x_n = x_{n-1} + 2x_{n-2} - x_{n-3}, n \geq 3$
 $x_0 = 1 \quad x_1 = 2 \quad x_2 = -1$

n	$x_{n-1} + 2x_{n-2} - x_{n-3}$	x_n
3	$-1 + 2(2) - 1$	$x_3 = 2$
4	$2 + 2(-1) - 2$	$x_4 = -2$
5	$-2 + 2(2) - (-1)$	$x_5 = 3$
6	$3 + 2(-2) - 2$	$x_6 = -3$
7	$-3 + 2(3) - (-2)$	$x_7 = 5$
8	$5 + 2(-3) - 3$	$x_8 = -4$

2) $x_n = 5x_{n-1} - 6x_{n-2}, x_0 = 0, x_1 = 1$
 $z^2 = 5z - 6 \Rightarrow z^2 - 5z + 6 = 0, z = 2, 3$

gen sol: $x_n = C_1(2)^n + C_2(3)^n$ $x_0 = C_1 2^0 + C_2 3^0 = 0$
 $C_1 + C_2 = 0$ $x_1 = 2C_1 + 3C_2 = 1$

$2C_1 + 3C_2 = 1 \Rightarrow C_2 = 1, C_1 = -1$

IVP sol: $x_n = (-1)2^n + 3^n$

3) C_n = females born at n , n = time in years?

p_1 = prob of 1 y/o to birth females

p_2 = prob of 2 y/o to birth females

$C_n = p_1 C_{n-1} + p_2 C_{n-2} \quad C_4 = p_1 C_3 + p_2 C_2$