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Hw

$$\textcircled{1} x_n = x_{n-1} + 2x_{n-2} - x_{n-3} \quad n \geq 3$$

$$x_0 = 1 \quad x_1 = 2 \quad x_2 = -1$$

$$x_3 = x_2 + 2x_1 - x_0 \quad x_3 = 4$$

$$4 = 4 - 2 - 1$$

$$x_4 = x_3 + 2x_2 - x_1 \quad x_4 = 0$$

$$x_5 = x_4 + 2x_3 - x_2 \quad x_5 = 13$$

$$13 = 0 + 2(4) - (-1)$$

$$x_6 = x_5 + 2x_4 - x_3 \quad x_6 = 9$$

$$9 = 13 + 2(0) - 4$$

$$x_7 = x_6 + 2x_5 - x_4 \quad x_7 = 35$$

$$35 = 9 + 2(13) - 0$$

$$x_8 = x_7 + 2x_6 - x_5 \quad x_8 = 40$$

$$\textcircled{\#2} \quad x_n - 5x_{n-1} + 6x_{n-2} = 0$$

$$r^2 - 5r + 6 = 0$$

$$(r-3)(r-2) = 0$$

$$x_n = 3^n - 2^n$$

$$x_n = A2^n + B3^n$$

$$x_0 = 1 \quad A + B = 0$$

$$x_1 = 1 \quad 2A + 3B = 1$$

$$A = 1, B = -1$$

$$\#3 \quad C_n = p_1 C_{n-1} + p_2 C_{n-2}$$

$$C_2 = p_1 C_1 + p_2 C_0$$

$$C_3 = p_1 C_2 + p_2 C_1 = p_1 (p_1 C_1 + p_2 C_0) + p_2 C_1 = C_0 (p_1 p_2) + C_1 (p_1^2 + p_2)$$

$$C_4 = p_1 C_3 + p_2 C_2 = C_0 (p_1^2 p_2 + p_2^2) + C_1 (p_1^3 + 2 p_1 p_2)$$