2 a, b, c, d, 3 a, b, c, d, 4 a, b, c, d, 5 a, b, c, d, 8, 9, 10

\[ \text{Proj 1.1} \]

2. \( \{ \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}, \ldots \} \rightarrow \{ \frac{1}{2^n} \}_{n=1}^{\infty} = a_n = \frac{1}{2^n} \quad (a_{n+1} = \frac{1}{2} a_n, \quad a_0 = \frac{1}{2}) \]

3d. \( \{ 1, 8, 29, 92, \ldots \} \)

Let \( x_0 = 1, \quad x_1 = 3 x_0 + 5, \quad \ldots, x_{n+1} = 3 x_n + 5 \quad \Rightarrow \Delta x_n = 2 x_n + 5 = x_n + 7.3^n \)

5b. \( a_{n+1} = 2a_n + 6, \quad a_0 = 0, \quad a_1 = 2a_0 + 6 = 6, \quad a_2 = 2a_1 + 6 = 4a_0 + 18 = 18 \)

\( a_3 = 2a_2 + 6 = 2(4a_0 + 18) + 6 = 8a_0 + 42 = 42 \)

5f. From class, \( r_n = (1 + i)^n, \quad P_0 = M (1+i)^n \quad i = 0.5\% = 0.005 \quad n = 360 \)

\( P_0 = 100,000 \quad P_{360} = 0 \quad M = \frac{i(1+i)^n P_0}{(1+i)^n - 1} = \frac{0.005(1.005)^{360}}{(1.005)^{360} - 1} = 599.55 \)

Proj 1.1 The car purchases with the plans given using the formula above would mean the typical buyer of the Saturn would pay $234.51/month for 5 yrs or $15,178.60. By paying $475/mo, the car would be paid off in 28 months at a total cost of $14,556.53. For the Cavalier, the typical buyer would pay $224.65 for 5 yrs or $14,979 (down payment). With $475/mo, the cost of this car reduces to $14,184.78. For the Hyundai, the typical buyer would pay $285.21/mo for 4 yrs or $14,044.88. With $475/mo, the cost of this car reduces to $13,320.88 and takes 26 months to pay off.

\( P_{n+1} = (1 + \frac{i}{2}) P_n - 475 \)