

Set 5.6

4)

Sol 5.6

$$4) d_0 = 3 \quad (\text{given})$$

$$d_1 = 1(d_0 - 1)^2 = 1(d_0)^2 = 1(3)^2 = 1(9) = 9$$

$$d_2 = 2(d_1 - 1)^2 = 2(d_1)^2 = 2(9)^2 = 2(81) = 162$$

$$d_3 = 3(d_2 - 1)^2 = 3(d_2)^2 = 3(162)^2 = 3(243, 244) = 72, 732$$

$$3, 9, 162, 72, 732$$

Sol 5.7

$$6) d = 2, d_1 = 2 * 2 + 3, d_2 = 2(2 * 2 + 3) + 3 = 2^3 + 2 * 3 + 3$$

Set 5.7

6)

$$6) d_1 = 2, d_2 = 2 * 2 + 3, d_3 = 2(2 * 2 + 3) + 3 = 2^3 + 2 * 3 + 3,$$

$$d_4 = 2(2^3 + 2 * 3 + 3) + 3 = 2^4 + 2^2 * 3 + 3.$$

$$d_k = 2^k + 3(2^{k-1} + \dots + 2 + 1)$$

$$= 2^k + 3 \cdot \frac{2^{k-1} - 1}{2 - 1} = 2^k + 3(2^{k-1} - 1)$$

for all $k \geq 1$

$$d_k = 2^k + 3(2^{k-1} - 1)$$

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7)

$$7) e_0 = 2$$

$$e_1 = 4 * 2 + 5$$

$$e_2 = 4(4 * 2 + 5) + 5 = 4^2 * 2 + 4 * 5 + 5$$

$$e_3 = 4(4^2 * 2 + 4 * 5 + 5) + 5$$

$$= 2 * 4^3 + 4^2 * 5 + 4 * 5 + 5$$

$$e_k = 2 * 4^k + 5(4^{k-1} + \dots + 4 + 1)$$

$$= 5 \left(\frac{4^k - 1}{3} \right) + 2 * 4^k$$

$$= \frac{11 * 4^k - 5}{3} \quad \text{for all } k \geq 1$$

$$e_k = \frac{11 * 4^k - 5}{3}$$