

$$1a) \quad x_2 = ax_1 - 5$$

$$\begin{aligned} x_2 &= a(2) - 5 \\ &= 2a - 5 \end{aligned}$$

$$\begin{aligned} b) \quad x_3 &= ax_2 - 5 \\ &= a(2a - 5) - 5 \\ &= 2a^2 - 5a - 5 \end{aligned}$$

$$\begin{aligned} c) \quad 2a^2 - 5a - 5 &= 20 \\ 2a^2 - 5a - 25 &= 0 \\ (2a + 5)(a - 5) &= 0 \end{aligned}$$

$$\underline{\underline{a = -\frac{5}{2}}} \quad \underline{\underline{a = 5}}$$

$$\begin{aligned} 2a) \quad x_2 &= 4x_1 - 1 \\ &= 4k - 1 \end{aligned}$$

$$\begin{aligned} b) \quad x_3 &= 4x_2 - 1 \\ &= 4(4k - 1) - 1 \\ &= 16k - 4 - 1 \\ &= 16k - 5 \end{aligned}$$

$$\begin{aligned} c) \quad x_4 &= 4x_3 - 1 \\ &= 4(16k - 5) - 1 \\ &= 64k - 20 - 1 \\ &= 64k - 21 \end{aligned}$$

$$k + 4k - 1 + 16k - 5 + 64k - 21$$

$$\underline{\underline{85k - 27}}$$

3a)

$$\begin{aligned}
 u_2 &= (u_1 - 1)^2 \\
 &= (1 - 1)^2 \\
 &= 0
 \end{aligned}$$

$$\begin{aligned}
 u_3 &= (u_2 - 1)^2 \\
 &= (0 - 1)^2 \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 u_4 &= (u_3 - 1)^2 \\
 &= (1 - 1)^2 \\
 &= 0
 \end{aligned}$$

$$b/ \quad u_{100} = 0$$

4a)

$$\begin{aligned}
 u_2 &= u_1 + c \\
 &= 3 + c
 \end{aligned}$$

$$\begin{aligned}
 u_3 &= u_2 + c \\
 &= 3 + c + c \\
 &= 3 + 2c
 \end{aligned}$$

$$\begin{aligned}
 u_4 &= u_3 + c \\
 &= 3 + 2c + c \\
 &= 3 + 3c
 \end{aligned}$$

$$u_5 = 3 + 4c$$

$$3 + 4c = 21$$

$$4c = 18$$

$$c = \frac{9}{2}$$

b/

$$3, 7.5, 12, 16.5, 21$$

$$\underline{\underline{4.5n - 1.5}}$$

5

$$\begin{aligned}u_3 &= u_2 + u_1 \\ &= 5 + 3 \\ &= 8\end{aligned}$$

$$\begin{aligned}u_4 &= u_3 + u_2 \\ &= 8 + 5 \\ &= 13\end{aligned}$$

$$\begin{aligned}u_5 &= u_4 + u_3 \\ &= 13 + 8 \\ &= 21\end{aligned}$$