2.3

1) $u_1 = \dfrac{1+2}{1+1} = \dfrac{3}{2}$

$u_2 = \dfrac{2+2}{2+1} = \dfrac{4}{3}$

$u_3 = \dfrac{3+2}{3+1} = \dfrac{5}{4}$

$u_4 = \dfrac{4+2}{4+1} = \dfrac{6}{5}$

$u_5 = \dfrac{5+2}{5+1} = \dfrac{7}{6}$

2) $u_1 = 1 - \dfrac{1}{1} = 0$

$u_2 = 1 - \dfrac{1}{2} = \dfrac{1}{2}$

$u_3 = 1 - \dfrac{1}{3} = \dfrac{2}{3}$

$u_4 = 1 - \dfrac{1}{4} = \dfrac{3}{4}$

$u_5 = 1 - \dfrac{1}{5} = \dfrac{4}{5}$

3) $u_1 = \dfrac{(-1)^1}{1^2} = -1$

$u_2 = \dfrac{(-1)^2}{2^2} = \dfrac{1}{4}$

$u_3 = \dfrac{(-1)^3}{3^2} = -\dfrac{1}{9}$

$u_4 = \dfrac{(-1)^4}{4^2} = \dfrac{1}{16}$

$u_5 = \dfrac{(-1)^5}{5^2} = -\dfrac{1}{25}$

4) $u_1 = \dfrac{2^{1-1}}{\sqrt{1}} = \dfrac{1}{1} = 1$

$u_2 = \dfrac{2^{2-1}}{\sqrt{2}} = \dfrac{2}{\sqrt{2}} = \dfrac{2\sqrt{2}}{2} = \sqrt{2}$

$u_3 = \dfrac{2^{3-1}}{\sqrt{3}} = \dfrac{4}{\sqrt{3}} = \dfrac{4\sqrt{3}}{3}$

$u_4 = \dfrac{2^{4-1}}{\sqrt{4}} = \dfrac{8}{2} = 4$

$$u_5 = \frac{2^{5-1}}{\sqrt{5}} = \frac{16}{\sqrt{5}} = \frac{16\sqrt{5}}{5}$$

5) $u_1 = 2 - \dfrac{1}{2^{1-1}} = 2 - \dfrac{1}{1} = 1$

$u_2 = 2 - \dfrac{1}{2^{2-1}} = 2 - \dfrac{1}{2} = \dfrac{3}{2}$

$u_3 = 2 - \dfrac{1}{2^{3-1}} = 2 - \dfrac{1}{4} = \dfrac{7}{4}$

$u_4 = 2 - \dfrac{1}{2^{4-1}} = 2 - \dfrac{1}{8} = \dfrac{15}{8}$

$u_5 = 2 - \dfrac{1}{2^{5-1}} = 2 - \dfrac{1}{16} = \dfrac{31}{16}$

6) $u_1 = \dfrac{1}{1} \cdot \sin\left(\dfrac{1 \cdot \pi}{2}\right) = 1 \cdot \sin\left(\dfrac{\pi}{2}\right) = 1 \cdot 1 = 1$

$u_2 = \dfrac{1}{2} \cdot \sin\left(\dfrac{2\pi}{2}\right) = \dfrac{1}{2} \cdot \sin(\pi) = \dfrac{1}{2} \cdot 0 = 0$

$u_3 = \dfrac{1}{3} \cdot \sin\left(\dfrac{3\pi}{2}\right) = \dfrac{1}{3} \cdot (-1) = -\dfrac{1}{3}$

$u_4 = \dfrac{1}{4} \cdot \sin\left(\dfrac{4\pi}{2}\right) = \dfrac{1}{4} \cdot \sin(2\pi) = \dfrac{1}{4} \cdot 0 = 0$

$u_5 = \dfrac{1}{5} \cdot \sin\left(\dfrac{5\pi}{2}\right) = \dfrac{1}{5} \cdot 1 = \dfrac{1}{5}$

7) $u_1 = 2$

$u_2 = 1 + 2\,u_1 = 1 + 2 \cdot 2 = 5$

$u_3 = 1 + 2\,u_2 = 1 + 2 \cdot 5 = 11$

$u_4 = 1 + 2\,u_3 = 1 + 2 \cdot 11 = 23$

$u_5 = 1 + 2\,u_4 = 1 + 2 \cdot 23 = 47$

8) $u_1 = 3$

$u_2 = \dfrac{u_1 - 2}{3} = \dfrac{3 - 2}{3} = \dfrac{1}{3}$

$u_3 = \dfrac{u_2 - 2}{3} = \dfrac{\frac{1}{3} - 2}{3} = \dfrac{-\frac{5}{3}}{3} = -\dfrac{5}{9}$

$u_4 = \dfrac{u_3 - 2}{3} = \dfrac{-\frac{5}{9} - 2}{3} = \dfrac{-\frac{23}{9}}{3} = -\dfrac{23}{27}$

$u_5 = \dfrac{u_4 - 2}{3} = \dfrac{-\frac{23}{27} - 2}{3} = \dfrac{-\frac{77}{27}}{3} = -\dfrac{77}{81}$