HW 11

2] $$a(n+3) = \frac{1+2a(n+2)+3a(n+1)+4a(n)}{2+3a(n+2)+4a(n+1)+5a(n)}$$

$$z = \frac{1+2z+3z+4z}{2+3z+4z+5z} = \frac{1+9z}{2+12z} = z$$

$$z - \frac{1+9z}{2+12z} = 0 = \frac{12z^2+2z-1-9z}{2+12z} = 0$$

$$12z^2-7z-1=0$$

$$z = \frac{7 \pm \sqrt{49-4(12)(-1)}}{12} = \frac{7 \pm \sqrt{97}}{12}$$

3] $$a(n+3) = \frac{1+2a(n+2)+3a(n+1)+4a(n)}{2+3a(n+2)+4a(n+1)+5a(n)}$$

$$x(n) = \begin{bmatrix} a(n+2) \\ a(n+1) \\ a(n) \end{bmatrix} \quad x(n+1) = F(x(n))$$

$$(x_1, x_2, x_3) \to \left(\frac{1+2x_1+3x_2+4x_3}{2+3x_1+4x_2+5x_3}, x_1, x_2 \right)$$

HW 11

4] $SS\left(\frac{(1-2\cdot x)(1-3\cdot x)}{r}, x\right)$

$x = \frac{r}{12} + \frac{5}{12} + \frac{\sqrt{r^2+10r+1}}{12}, \frac{r}{12} + \frac{5}{12} - \frac{\sqrt{r^2+10r+1}}{12}$

$r_0 \approx 3.45$

5] i) $r = 2.5$

ii) $r = 1.9$

iii) $r = 1.6$