

hw 12 Zachariah Ali

1.

$r=12$, ultimate period 1,

$$r_1 = 8$$

$$r_2 = 3.33$$

$$r_3 = 2.575$$

$$r_4 = 2.48277674281$$

$s_0 \left(\frac{1}{11}, \frac{1}{11} \right)$ is stable.

$$T = \left[\frac{2x + 20y + 13z}{1 + 21x + 20y}, \frac{18x + 26y + 23z}{17x + 20y + 23 + 14x + 2y} \right]$$

$$SS_g = [0.31, -4.86] \quad orb = [2.31, 1.15]$$

$$T = \left[\frac{6 + 26x + 2y}{6 + 16x + 8y}, \frac{14 + 19x + y}{18x + 19 + 13x + 7y} \right]$$

$$SS_g = [0.00959, -3.219] \quad orb = [0.919, 1.20]$$

$$T = \left[\frac{11 + 18x + 12y}{7 + 22x + 3y}, \frac{7 + 24x + 23y}{17 + 16x + 21y} \right]$$

$$SS_g = [0.61, -0.433] \quad orb = [0.907, 1.20]$$

$$T = \left[\frac{14 + 29x + 27y}{9 + 15x + y}, \frac{11 + 18x + 14y}{4 + 15x + 27y} \right]$$

$$SS_g = [0.747, -0.474] \quad orb = [2.50, 1.02]$$

$$3. \quad T = \left[\frac{6 + x + 7y + 7z}{4 + 4x + 9y + 4z}, \frac{10 + 8x + 10y + 7z}{6 + x + 8y + 8z}, \frac{8 + 5x + 8y + 4z}{2 + 2x + 3y + 4z} \right]$$

$$T = \left[\frac{4 + 9x + 9y + 2z}{9 + 3x + 10y + 10z}, \frac{4 + x + 4y + 4z}{1 + x + 6y + 5z}, \frac{7 + 7x + 4y + 9z}{10 + x + 7y + 5z} \right]$$

$$T = \left[\frac{2 + 7x + 3y + 3z}{9 + 7x + 10y + 3z}, \frac{8 + 10x + 9y + 6z}{9 + 9x + 3y + 6z}, \frac{9 + x + 9y + 5z}{3 + 6x + 6y + 2z} \right]$$

$$T = \left[\frac{2 + 9x + 7y + 6z}{7 + 5x + 5y + z}, \frac{3 + 2x + 10y + z}{7 + 8x + 15y + z}, \frac{6 + 5x + 3y + 4z}{3 + 6x + 3y + 8z} \right]$$