

$$(2)(a) S_1: (1-.5)/3 = 1/6$$

$$S_2: (1-.4)/3 = .2$$

$$S_3: (1-.3)/3 = .2333$$

$$S_4: (1-.2)/3 = .2666$$

.5	1/6	1/6	1/6
.2	.4	.2	.2
.233	.233	.3	.233
.266	.266	.266	.2

$$(b) S1: .315197 \quad S2: .262664 \quad S3: .22541 \quad S4: .196992$$

$$S_1 > S_2 > S_3 > S_4$$

HW 6

①

$$\begin{bmatrix} 2.089 & .858 & .681 & 1.654 & 2.158 \\ .381 & 0 & 0 & 0 & 0 \\ 0 & .883 & 0 & 0 & 0 \\ 0 & 0 & .616 & 0 & 0 \\ 0 & 0 & 0 & .433 & 0 \end{bmatrix}$$

$$\lambda = 2.308$$

$\therefore$ exponential growth

$$\begin{bmatrix} 1.176 & 1.03 & 2.187 & 1.316 & .179 \\ .358 & 0 & 0 & 0 & 0 \\ 0 & .664 & 0 & 0 & 0 \\ 0 & 0 & .164 & 0 & 0 \\ 0 & 0 & 0 & .158 & 0 \end{bmatrix}$$

$$\lambda = 1.615698$$

$\therefore$ exponential growth

$$\begin{bmatrix} .238 & 1.285 & .614 & 1.352 & 1.643 \\ .084 & 0 & 0 & 0 & 0 \\ 0 & .267 & 0 & 0 & 0 \\ 0 & 0 & .835 & 0 & 0 \\ 0 & 0 & 0 & .512 & 0 \end{bmatrix}$$

$$\lambda = .636270, .130 \pm .3981i$$

$\therefore$ extinction

$$\begin{bmatrix} 1.595 & 1.595 & 1.903 & 2.548 & 2.173 \\ .55 & 0 & 0 & 0 & 0 \\ 0 & .65 & 0 & 0 & 0 \\ 0 & 0 & .291 & 0 & 0 \\ 0 & 0 & 0 & .326 & 0 \end{bmatrix}$$

$$\lambda = 2.172206$$

$\therefore$ exponential growth

$$\begin{bmatrix} .274 & 1.391 & 1.507 & .941 & .142 \\ .281 & 0 & 0 & 0 & 0 \\ 0 & .086 & 0 & 0 & 0 \\ 0 & 0 & .214 & 0 & 0 \\ 0 & 0 & 0 & .727 & 0 \end{bmatrix}$$

$$\lambda = .743, -.378, -.019$$

$\therefore$ extinction

2.076	1.663	1.67	2.775	2.525
.322	0	0	0	0
0	.039	0	0	0
0	0	.274	0	0
0	0	0	.358	0

$$\lambda = 2.3113$$

$\therefore$ growth

1.882	2.17	.048	1.783	1.67
.143	0	0	0	0
0	.138	0	0	0
0	0	.626	0	0
0	0	0	.287	0

$$\lambda = 2.037$$

$\therefore$ growth

.737	2.518	2.465	2.730	.386
.074	0	0	0	0
0	.125	0	0	0
0	0	.359	0	0
0	0	0	.382	0

$$\lambda = .633, -.333, -.059$$

$\therefore$ extinction

1.028	.912	1.251	2.041	2.626
.459	0	0	0	0
0	.602	0	0	0
0	0	.527	0	0
0	0	0	.562	0

$$\lambda = 1.867869$$

$\therefore$ growth

1.279	2.68	2.832	1.506	1.872
.104	0	0	0	0
0	.286	0	0	0
0	0	.373	0	0
0	0	0	.78	0

$$\lambda = 2.04344$$

$\therefore$ growth