

$$1. (x, y) = (x + y^4 - \frac{1}{6}, x^2 + y - \frac{1}{9})$$

$$x = \pm \frac{1}{3} \quad y = \pm \frac{1}{2}$$

$$J = \begin{bmatrix} 1 & 4y^3 \\ 2x & 1 \end{bmatrix}$$

$$\text{For } (-\frac{1}{3}, -\frac{1}{2}) = \begin{bmatrix} 1-\lambda & -\frac{1}{2} \\ -\frac{2}{3} & 1-\lambda \end{bmatrix} \Rightarrow \lambda^2 - 2\lambda + \frac{2}{3}$$

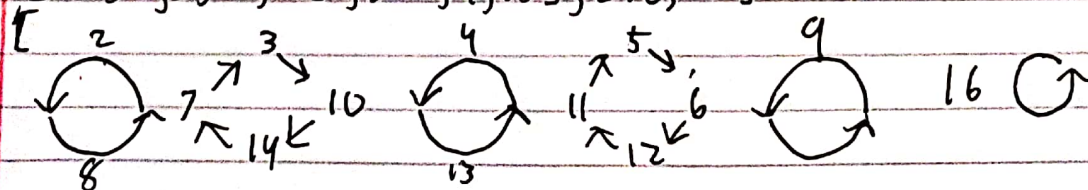
$$\text{for } (-\frac{1}{3}, \frac{1}{2}) = \begin{bmatrix} 1-\lambda & \frac{1}{2} \\ -\frac{2}{3} & 1-\lambda \end{bmatrix} \rightarrow \lambda^2 - 2\lambda + \frac{4}{3}$$

$$\text{For } (\frac{1}{3}, -\frac{1}{2}) = \begin{bmatrix} 1-\lambda & -\frac{1}{2} \\ \frac{2}{3} & 1-\lambda \end{bmatrix} \Rightarrow \lambda^2 - 2\lambda + \frac{4}{3}$$

$$\text{For } (\frac{1}{3}, \frac{1}{2}) = \begin{bmatrix} 1-\lambda & \frac{1}{2} \\ \frac{2}{3} & 1-\lambda \end{bmatrix} \rightarrow \lambda^2 - 2\lambda + \frac{2}{3}$$

All values $|\lambda|$ are not ≤ 1 , unstable

2. $[1, 1], [2, 8, 2], [3, 10, 14, 7, 3], [4, 13, 4], [7, 13, 4], [10, 14, 7, 3, 10], [11, 5, 6, 12, 11], [12, 11, 5, 6, 12]$
 $[14, 7, 3, 10, 14], [15, 9, 15], [16, 11]$ $[13, 4, 13]$



3.

- i
- | | |
|-------------------------------------|-------------------------------------|
| $[14, (27, 45, 9), 81, 63, 27]$ | $[69, (27, 45, 9, 81, 63, 27)]$ |
| $[21, (9, 81, 63, 27), 45, 9]$ | $[58, (27, 45, 9, 81, 63, 27)]$ |
| $[11, 0]$ | $[31, 18, (63, 27, 45, 9, 81, 63)]$ |
| $[42, 18, (63, 27, 45, 9, 81, 63)]$ | $[23, (9, 81, 63, 27, 45, 9)]$ |
| $[75, 18, (63, 27, 45, 9, 81, 63)]$ | $[63, 27, 45, 9, 81, 63]$ |

- ii.
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|------------------------------------|
| $[420, 396, 594, (495, 495)]$ |
| $[125, 396, 594, (495, 495)]$ |
| $[327, (495, 495)]$ |
| $[447, 297, 693, 594, (495, 495)]$ |
| $[882, 594, (495, 495)]$ |

- iii
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| $[1225, 3996, 6264, 4176, (6174, 6174)]$ |
| $[3200, 3168, 7263, 5265, 3996, 6264, 4176, (6174, 6174)]$ |
| $[7318, 7353, 4176, (6174, 6174)]$ |