

HW 8

①	a) $f(x) = \frac{3x^3 + 4x^2 + 7x + 9}{10x^3 + 3x^2 + 3x + 4}$	all states converge to	1.0756
	b) $f(x) = \frac{2x^3 + 3x^2 + 6x + 2}{7x^3 + 7x^2 + 9x + 6}$	↓ ↓ ↓ ↓	0.4538
	c) $f(x) = \frac{10x^3 + 3x^2 + 6x + 9}{6x^3 + 2x^2 + 9x + 8}$	✓ +	1.1707
	d) $f(x) = \frac{3x^3 + 5x^2 + 9x + 6}{4x^3 + 8x^2 + 4x + 1}$	↓ ↓	1.000
	e) $f(x) = \frac{6x^3 + 5x^2 + 4x + 4}{9x^3 + 8x^2 + 4x + 1}$	✓ ↓	0.9055
	f) $f(x) = \frac{9x^3 + 7x^2 + 7x + 3}{6x^3 + 6x^2 + 2x + 10}$	✓ ↓	1.1640
	g) $f(x) = \frac{x^3 + 4x^2 + 5x + 2}{7x^3 + x^2 + 2x + 3}$	↓ ✓	.9502
	h) $f(x) = \frac{3x^3 + 10x^2 + 10x + 2}{5x^3 + 10x^2 + 6x + 1}$	✓ ↓	1.1030
	i) $f(x) = \frac{x^3 + 3x^2 + 5x + 1}{5x^3 + 5x^2 + 7x + 4}$	✓ ↓	0.4607
	j) $f(x) = \frac{9x^3 + 5x^2 + 8x + 10}{7x^3 + 4x^2 + 5x + 9}$	↓ ↓	1.2116

- ② For $K \leq 2.5$, orbit converges to stable fixed pt
 $\rightarrow K=1$, converge to 0; $K=2$, converge to $1/2$
 For $K=3.1-3.3$, there are oscillations b/w 2 #s
 For $K > 3.5$, the orbit does not settle, and has no pattern

- ③ Smallest K w/ 2 stable states $K=8$ (steady @ $x=.881, 7.111$)
 Smallest K w/ 4 stable states $K=14$ ($x=.615, 2.354, 5.646, 7.388$)