

P. 50

$$1 a. F(x) = x^2 - \frac{x}{2} = x$$

$$x^2 + \frac{3x}{2} = 0$$

$$x(x + \frac{3}{2}) = 0$$

fixed points are 0 & $+\frac{3}{2}$

$$F' = 2x - \frac{1}{2}$$

$$F'(0) = -\frac{1}{2} \quad \text{attracting}$$

$$F'(\frac{3}{2}) = 3 - \frac{1}{2} = 2\frac{1}{2} \quad \text{repelling}$$

$$b. F(x) = x(1-x) = x - x^2$$

$$x - x^2 = x$$

$$x^2 = 0$$

$x = 0$ only fixed point.

$$F'(x) = 1 - 2x$$

$$F'(0) = 1 \quad \text{neutral}$$

$$c. F(x) = 3x(1-x) = 3x - 3x^2$$

$$3x - 3x^2 = x, \quad 2x - 3x^2 = 0, \quad x(2 - 3x) = 0$$

Fixed points at $x = 0$, $x = \frac{2}{3}$

$$F'(x) = 3 - 6x$$

$$F'(0) = 3 \quad \text{repelling}$$

$$F'(\frac{2}{3}) = 3 - 4 = -1 \quad \text{neutral}$$