

Max Mekharikov - Nov 19 quiz

a) i) continuous-time

$$\text{ii) } x'(t) = -2x(t)$$

$$\text{iii) } F(x) = -2x, \quad F'(x) = -2$$

$$\text{iv) } -2x = 0$$
$$x = 0$$

$$\text{v) } x = 0$$

b) i) discrete time

$$\text{ii) } x(n) = \frac{1}{2}x(n-1)$$

$$\text{iii) } F(x) = \frac{1}{2}x, \quad F'(x) = \frac{1}{2}$$

$$\text{iv) } \frac{1}{2}x = 0 \rightarrow x = 0$$

$$\text{v) } x = 0$$

c) i) discrete-time

$$\text{ii) } x(n) = 2x(n-1)(1-x(n-1))$$

$$\text{iii) } F(x) = 2x(1-x)$$

$$\text{iv) } F'(x) = 2 - 4x$$

$$2 - 4x = 0$$

$$x = 1/2$$

$$\text{v) } |F'(1/2)| < 1, \text{ stable}$$

d) i) continuous time

$$\text{ii) } x'(t) = 2x(t)(1-x(t))$$

$$\text{iii) } F(x) = 2x(1-x)$$