Nguyen Xuan Binh 887799 Theory Exercise Week 5

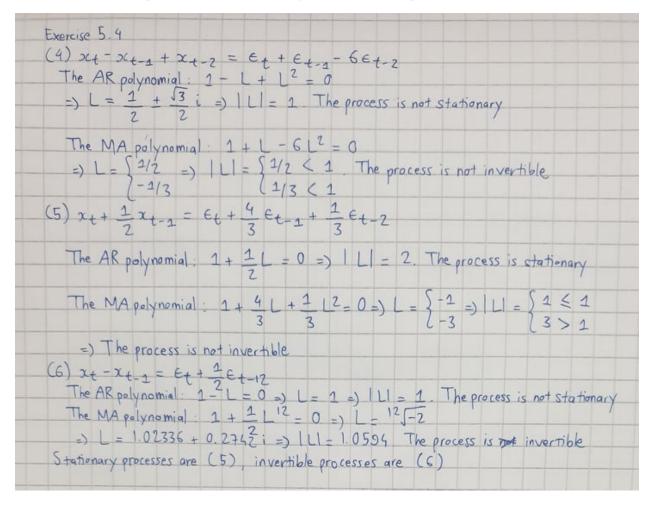
5.4 Consider the following ARMA processes:

$$x_t - x_{t-1} + x_{t-2} = \epsilon_t + \epsilon_{t-1} - 6\epsilon_{t-2}, \tag{4}$$

$$x_t + \frac{1}{2}x_{t-1} = \epsilon_t + \frac{4}{3}\epsilon_{t-1} + \frac{1}{3}\epsilon_{t-2},\tag{5}$$

$$x_t - x_{t-1} = \epsilon_t + \frac{1}{2} \epsilon_{t-12}. \tag{6}$$

Which of the processes are stationary? Which of the processes are invertible?



5.5 Derive the optimal s-step prediction for the invertible MA(q) process,

$$x_t = \sum_{i=0}^{q} \theta_i L^i \varepsilon_t, \quad \varepsilon_t \sim \mathrm{iid}(0, \sigma^2),$$

$$\theta_0 = 1,$$

in the sense of mean squared error, when the process ε_t has been observed up to point of time t.

