Quiz 3: mini problems 1,2,3

Question 1. a) Suppose that

$$X_t = \varepsilon_t + t, \quad t = 1, 2, ...$$

where ε_t is a white noise sequence with zero mean and variance $E\varepsilon_t^2 = 1$. Investigate whether time series X_t is covariance stationary.

b) Suppose that

$$X_t = t\varepsilon_t, \quad t = 1, 2, ...$$

where ε_t is a white noise sequence with zero mean and variance $E\varepsilon_t^2 = 1$. Investigate whether time series X_t is covariance stationary.

Question 2. Explain why the following sequence

$$\rho_1 = 0.8, \quad \rho_2 = 0.5, \quad \rho_3 = \rho_1 + \rho_2, \quad \rho_4 = \rho_1 + \rho_2 + \rho_3, ...$$

cannot be the auto-correlation function of a covariance stationary sequence.

Question 3. Using the following EVIEWS correlogram of time series X_t, determine whether x_t is a white noise time series.

Correlogram of Y

Date: 29/11/20 Time: 10:53
Sample: 1 400
Included observations: 400

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.023	-0.023	0.2196	0.639
		2	-0.032	-0.033	0.6458	0.724
		3	-0.036	-0.037	1.1600	0.763
		4	-0.057	-0.060	2.4792	0.648
		5	0.050	0.045	3.4877	0.625
		6	-0.076	-0.080	5.8704	0.438
		7	0.067	0.063	7.7087	0.359
		8	-0.009	-0.012	7.7392	0.459
		9	0.012	0.016	7.7940	0.555
		10	-0.041	-0.049	8.4897	0.581