← ## ARMA Processes   **3/3 points (100.00%)**

Quiz, 3 questions

✔ # Congratulations! You passed! | Next Item |

✔   1 / 1
      points

1.
Recall our framework:

$$X_t = Noise + Autoregressive\ Part + Moving\ Average\ Part$$

$$X_t = Z_t + \phi_1 X_{t-1} + \ldots + \phi_p X_{t-p} + \theta_1 Z_{t-1} + \ldots + \theta_q Z_{t-1}$$

$$\Theta(B)Z_t = \Phi(B)X_t$$

$$\Psi(B) = \frac{\Theta(B)}{\Phi(B)}$$

$$X_t = \frac{\Theta(B)}{\Phi(B)}Z_t = \Psi(B)Z_t$$

We develop an MA model for the mixed process

$$X_t = 0.5X_{t-1} + Z_t + 0.2Z_{t-1}.$$

Find $\Psi(B)$ and use it to express the denominator as a geometric series.

◉ $1 + .5B + .25B^2 + .125B^3 + \cdots$
▲

Correct
Yes, that's terrific! We use

$$\Psi(B) = \frac{1+.2B}{1-.5B}$$

and then express

$$\frac{1}{1-.5B} = 1 + (.5B) + (.5B)^2 + (.5B)^3 + \ldots$$

◯ $1 - (.5B) + (.5B)^2 - (.5B)^3 + \ldots$

✔   1 / 1
      points

2.

Now multiply

ARMA Processes $\Psi(B) = (1 + .2B)(1 + .5B + .25B^2 + .125B^3 + \cdots)$ **3/3 points (100.00%)**

and obtain an expression for X_t:

    ⊙ $\Psi(B) = 1 + .7B + .35B^2 + .175B^3 + \ldots$

    ▲

Correct

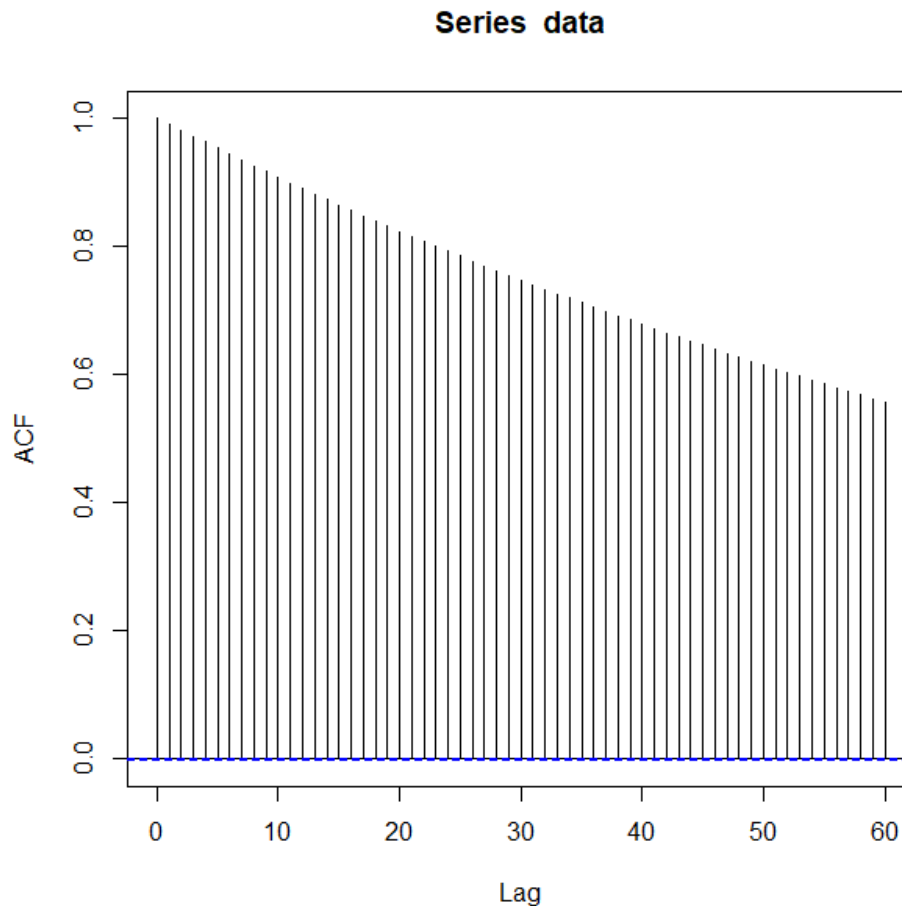Good work. We multiply just as we regularly do for finite order polynomials.

    ○ $\Psi(B) = 1 + .5B + .2B^2 + \ldots$

✔   1 / 1
points

3.

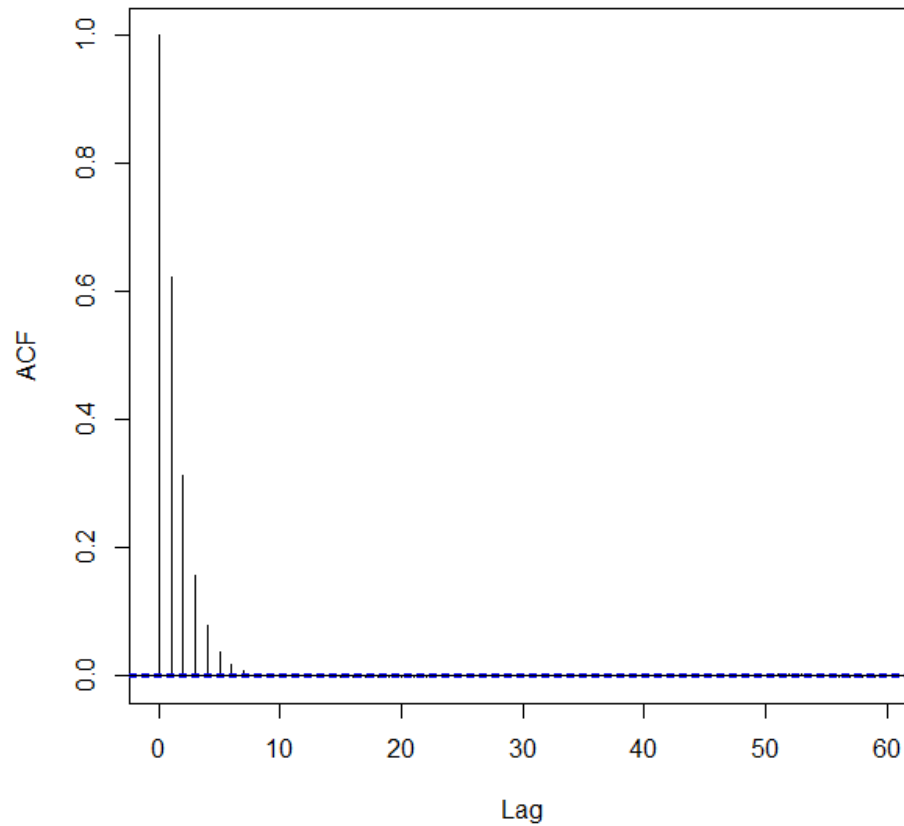Finally, which ACF looks to be consistent with this process?

    ○   ACF1:

Series data

ARMA Processes
ACF 2.

Quiz, 3 questions

Series data

Correct

Good! The coefficients on the polynomial should decay rather quickly.