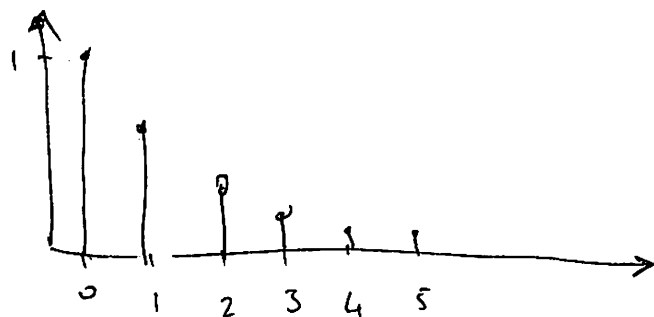
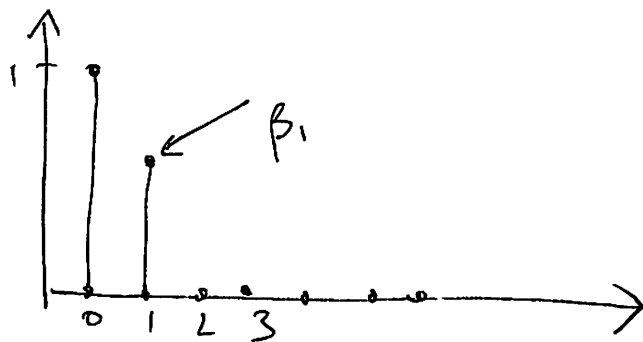


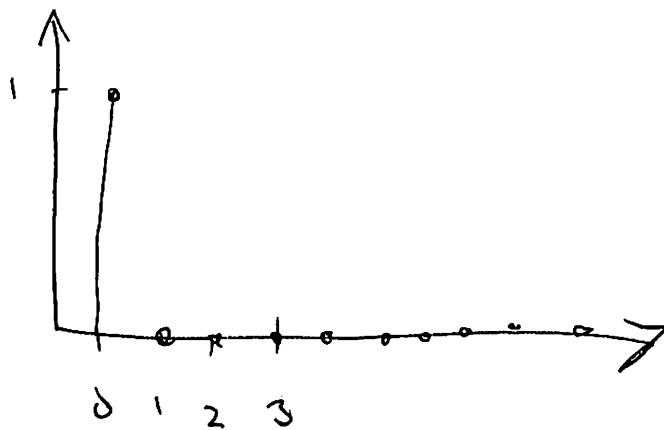
AR(1)



MA(1)



WN



YULE-WALKER Eqn's for AR(p)

①

$$AR(p): X_t = \alpha_1 X_{t-1} + \alpha_2 X_{t-2} + \dots + \alpha_p X_{t-p} + Z_t$$

Multiply both sides
by X_{t-h}

$$X_t X_{t-h} = \alpha_1 X_{t-1} X_{t-h} + \alpha_2 X_{t-2} X_{t-h} + \dots + \alpha_p X_{t-p} X_{t-h} + Z_t X_{t-h}$$

Take expectation
of both sides

$$E(X_t X_{t-h}) = \alpha_1 E(X_{t-1} X_{t-h}) + \alpha_2 E(X_{t-2} X_{t-h}) + \dots \\ + \alpha_p E(X_{t-p} X_{t-h}) + E(Z_t X_{t-h})$$

$$\underline{E(X_t X_{t-h}) = \gamma(h)}$$

$E(Z_t X_{t-h}) =$	
$\begin{cases} \sigma^2 & h=0 \\ 0 & h \geq 1 \end{cases}$	

$$\left\{ \begin{array}{l} \gamma(h) = \alpha_1 \gamma(h-1) + \alpha_2 \gamma(h-2) + \\ \dots + \alpha_p \gamma(h-p) \quad h \geq 1 \end{array} \right.$$

$$\gamma(h) = \alpha_1 \gamma(h-1) + \dots + \alpha_p \gamma(h-p) + \sigma^2 \quad h=0$$

→ YULE-WALKER eqn's

Divide $\gamma(h)$ by $\gamma(0)$ to get $\rho(h)$