



### MA(1) Solution Summary

Model:  $X_t = 5 + \varepsilon_t + (-0.4)\varepsilon_{t-1}$   
 $\varepsilon_t \sim WN(0, 4)$

#### Results:

1. Mean:  
 $E[X_t] = 5$
2. Variance:  
 $\gamma(0) = \sigma^2(1+\theta^2) = 4 \times 1.16 = 4.64$
3. Autocovariance at lag 1:  
 $\gamma(1) = \theta\sigma^2 = -0.4 \times 4 = -1.6$
4. Autocorrelation:  
 $\rho(1) = \theta/(1+\theta^2) = -0.3448$   
 $\rho(h) = 0 \text{ for } h > 1$
5. Invertibility:  
 $|\theta| = 0.4 < 1$   
 $\rightarrow \text{INVERTIBLE } \checkmark$