3.

a) $\gamma_x(k) = (1-0.4B)^2 \gamma_y(k)$ e $\gamma_w(k) = (1-2.5B)^2 \gamma_y(k)$

4.

a) $Y_t = 2Y_{t-1} - Y_{t-2} + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \theta_2 \varepsilon_{t-2} - \theta_3 \varepsilon_{t-3}$

b) $\hat{Y}_t(m) = 2\hat{Y}_t(m-1) - \hat{Y}_t(m-2), \quad m > 3$

6.

$\hat{Y}_{49}(1) = 32.6$ ; $\hat{Y}_{49}(2) = 33.12$ ; $\hat{Y}_{49}(3) = 33.25$ ; $\hat{Y}_{49}(4) = 33.28$

7.

a) $Y_t = \sum_{j=0}^{\infty} \psi_j \varepsilon_{t-j}$ com $\psi_1 = 0.3$ e $\psi_j = 0.3\psi_{j-1} + 0.6\psi_{j-2}$, $j > 1$

b) $\phi_{11} = 0.75$ ; $\phi_{22} = 0.6$ ; $\phi_{kk} = 0$, $k \geq 3$

8. a) 20 b) No

9.

a) $Y_t(1) = 2 - 0.6\varepsilon_t$ ; $Y_t(m) = 2$, $m \geq 2$

b) $Var(e_t(1)) = 0.01$ ; $Var(e_t(m)) = 0.0136$, $m \geq 2$

10. See W. Wei (2007, p. 95)

11.

a) $Y_t = Y_{t-1} + Y_{t-12} - Y_{t-13} + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \Theta_1 \varepsilon_{t-12} + \theta_1 \Theta_1 \varepsilon_{t-13}$

b) $\hat{Y}_{100}(1) = Y_{100} + Y_{89} - Y_{88} - 0.33\hat{\varepsilon}_{100} - 0.82\hat{\varepsilon}_{89} + 0.27\hat{\varepsilon}_{88}$

$\hat{Y}_{100}(2) = \hat{Y}_{100}(1) + Y_{90} - Y_{89} - 0.82\hat{\varepsilon}_{90} + 0.27\hat{\varepsilon}_{89}$

$\hat{Y}_{100}(3) = \hat{Y}_{100}(2) + Y_{91} - Y_{90} - 0.82\hat{\varepsilon}_{91} + 0.27\hat{\varepsilon}_{90}$

$\hat{Y}_{100}(m) = \hat{Y}_{100}(m-1) + \hat{Y}_{100}(m-12) - \hat{Y}_{100}(m-13)$

$+ E(\varepsilon_{100+m} \mid Y_{100}, Y_{99}, \ldots) - 0.33E(\varepsilon_{100+m-1} \mid \ldots)$

$- 0.82E(\varepsilon_{100+m-12} \mid \ldots) + 0.27E(\varepsilon_{100+m-13} \mid \ldots)$