TEST #2

STA 4853 **Name:**____________________________________

April 28, 2016

Please read the following directions.
DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO

Directions

- This exam is **closed book** and **closed notes**.
- There are 30 multiple choice questions.
- Circle the **single best** answer for each multiple choice question. Your choice should be made clearly.
- Always **circle the correct response**. (Sometimes the question has an empty blank or a box, but this is **NOT** where the answer goes.)
- There is no penalty for guessing.
- The exam has **11** pages.
- Each question is worth equal credit.

Problem 1. One general approach to modeling a series with a non-stationary mean which exhibits seasonal patterns or seasonal variation is to _________.

a) make the series stationary by ordinary and/or seasonal differencing, and then choose an appropriate ARIMA$(p, 0, q)(P, 0, Q)_s$ process to model the differenced series

b) choose an appropriate ARIMA$(p, 0, q)(P, 0, Q)_s$ process to eliminate the seasonal effects, and then transform the resulting series (for example, by using a log or square root transformation) to eliminate the non-stationarity

c) choose an appropriate ARIMA$(p, 0, q)(P, 0, Q)_s$ process to eliminate the seasonal effects, and then difference the resulting series (using ordinary and/or seasonal differencing) to eliminate the non-stationarity

d) transform the series (for example, by using a log or square root transformation), and then choose an appropriate ARIMA$(p, 0, q)(P, 0, Q)_s$ process to model the transformed series

Problem 2. Transforming a series z_t (that is, modeling $y_t = f(z_t)$ instead of z_t for some appropriately chosen function f such as log or square root) is useful when _________

a) the level of the series changes systematically with time.

b) the level of the series z_t changes periodically with time.

c) the level of the series z_t changes repeatedly over time.

d) the variability of the series z_t changes systematically with time.

e) the variability of the series z_t changes systematically with the level of the series.

f) the variability of the series z_t changes periodically with time.

Problem 3. A series which approximately repeats a consistent seasonal pattern is _________.

a) stationary **b)** non-stationary **c)** invertible **d)** non-invertible **e)** multiplicative

f) non-multiplicative **g)** integrated **h)** differenced **i)** over-differenced **j)** autoregressive

Problem 4. If you model a time series z_t using a **stationary ARMA process with a non-zero constant** ($C \neq 0$) and use it to forecast future values of z_t, then as you forecast further and further into the future, the **confidence interval widths** for your forecasts will _________

a) continue to increase and eventually reach arbitrarily large values

b) follow a straight line with a non-zero slope

c) gradually decay to zero

d) cutoff to zero after some lag

e) converge to a non-zero limiting value

f) converge to a repeating pattern with period C

Problem 5. The sample IACF of an invertible process will ________.

a) have all of its roots strictly inside the unit circle
b) have all of its roots strictly outside the unit circle
c) decay to zero at a reasonable rate
d) decay to zero very slowly
e) indicate there has been overdifferencing
f) be the same as the PACF of the dual process
g) depend only on the MA coefficients

Problem 6. Which one of the following choices for $v(B)$ will produce a transfer function $v(B)X_t$ with v-weights which decay sinusoidally? (Note: alternating exponential decay is **not** considered to be sinusoidal.)

a) $v(B) = \dfrac{B(1-0.8B)}{1-1.6B-(-0.8)B^2}$
b) $v(B) = \dfrac{1-1.6B-(-0.8)B^2}{1-0.8B}$
c) $v(B) = \dfrac{1-1.6B-(-0.8)B^2}{1-(-0.8)B}$
d) $v(B) = \dfrac{B^2(1-1.6B-(-0.8)B^2)}{1-0.8B}$
e) $v(B) = \dfrac{B^2}{1-(-0.8)B}$
f) $v(B) = B(1-1.6B-(-0.8)B^2)$

Problem 7. An MA(1) process with $|\theta_1| < 1$ can be re-written in the form ________.

a) $\tilde{z}_t = a_t + \theta_1\tilde{z}_{t-1} + \theta_2\tilde{z}_{t-2} + \theta_3\tilde{z}_{t-3} + \cdots$
b) $\tilde{z}_t = a_t + \theta_1 a_{t-1} + \theta_1^2 a_{t-2} + \theta_1^3 a_{t-3} + \cdots$
c) $\tilde{z}_t = a_t - \theta_1 a_{t-1} - \theta_1^2 a_{t-2} - \theta_1^3 a_{t-3} - \cdots$
d) $\tilde{z}_t = a_t - \theta_1 a_{t-1} - \theta_2 a_{t-2} - \theta_3 a_{t-3} - \cdots$
e) $\tilde{z}_t = a_t - \theta_1\tilde{z}_{t-1} - \theta_1^2\tilde{z}_{t-2} - \theta_1^3\tilde{z}_{t-3} - \cdots$
f) $\tilde{z}_t = a_t + \theta_1\tilde{z}_{t-1} + \theta_1^2\tilde{z}_{t-2} + \theta_1^3\tilde{z}_{t-3} + \cdots$

Problem 8. Suppose that Y has a Normal distribution with mean μ and variance σ^2 (that is, $Y \sim N(\mu, \sigma^2)$). Then $X = e^Y$ has a log-normal distribution with **median** equal to ________.

a) $\log(\mu)$ **b)** $\log(\sigma^2)$ **c)** $\log(\mu + (\sigma^2)/2)$ **d)** $e^{\mu+(\sigma^2)/2}$ **e)** e^{μ} **f)** e^{σ^2}

Problem 9. If you have a transfer function model

$$Y_t = C + v(B)X_t + N_t$$

where the noise process N_t is an ARIMA$(p,d,q)(P,D,Q)_s$ process, then you can write the noise process as ________, where as usual a_t denotes a random shock process, and $\phi(B)$ and $\theta(B)$ are the AR and MA polynomials, respectively.

a) $N_t = \dfrac{(1-B)^d(1-B^s)^D\phi(B)}{\theta(B)}a_t$

b) $N_t = \dfrac{(1-B^d)(1-B^D)^s\phi(B)}{\theta(B)}a_t$

c) $N_t = \dfrac{\phi(B)}{(1-B)^d(1-B^s)^D\theta(B)}a_t$

d) $N_t = \dfrac{\theta(B)}{(1-B)^d(1-B^s)^D\phi(B)}a_t$

e) $N_t = \dfrac{\phi(B)}{(1-B^d)(1-B^D)^s\theta(B)}a_t$

f) $N_t = \dfrac{(1-B^d)(1-B^D)^s\theta(B)}{\phi(B)}a_t$

Problem 10. The SAS code given below ________

```
PROC ARIMA DATA=STUFF;
IDENTIFY VAR=Y CROSSCOR=(X1 X2 X3) NOPRINT;
ESTIMATE INPUT=(X1 X2 X3) METHOD=ML;
QUIT;
```

a) fits a transfer function model for Y_t on $X_{t-1}, X_{t-2}, X_{t-3}$.

b) fits a transfer function model for Y_t on $X_{1,t}$, $X_{2,t}$, $X_{3,t}$.

c) fits a multiple regression model for Y_t on the regressors $X_{1,t}$, $X_{2,t}$, $X_{3,t}$.

d) fits a multiple regression model for Y_t on the regressors $X_{t-1}, X_{t-2}, X_{t-3}$.

e) uses pre-whitening to identify a transfer function for Y_t on $X_{1,t}$, $X_{2,t}$, $X_{3,t}$.

f) uses pre-whitening to identify a transfer function for Y_t on $X_{t-1}, X_{t-2}, X_{t-3}$.

g) fits a transfer function model for Y_t on $X_{t-1}, X_{t-2}, X_{t-3}$ using a proxy AR(2) model for the noise.

h) fits a transfer function model for Y_t on $X_{1,t}$, $X_{2,t}$, $X_{3,t}$ using a proxy AR(2) model for the noise.

Problem 11. Suppose we wish to forecast an AR(1) process $z_t = C + \phi_1 z_{t-1} + a_t$ and we know all the values of z_t and a_t up to time n. What is the best forecast for z_{n+2}?

a) μ_z **b)** z_n **c)** $\mu_z + \phi_1^2 z_n$ **d)** $z_n + \phi_1^2 a_n$

e) $C + \phi_1 C + \phi_1^2 z_n$ **f)** $C + \phi_1 C + \phi_1^2 a_n$ **g)** $z_n + \phi_1 z_n + \phi_1^2 a_n$ **h)** $z_n + \phi_1 C + \phi_1^2 a_n$

Problem 12. The model

$$(1 - \phi_1 B - \phi_2 B^2)(1 - \Phi_1 B^s) z_t = C + a_t$$

may be re-written as ________.

a) $z_t = C - \phi_1 z_{t-1} - \phi_2 z_{t-2} - \Phi_1 z_{t-s} - \phi_1 \Phi_1 z_{t-s-1} - \phi_2 \Phi_1 z_{t-s-2} + a_t$
b) $z_t = C + \phi_1 z_{t-1} + \phi_2 z_{t-2} + \Phi_1 z_{t-s} + \phi_1 \Phi_1 z_{t-s-1} + \phi_2 \Phi_1 z_{t-s-2} + a_t$
c) $z_t = C + \phi_1 z_{t-1} + \phi_2 z_{t-2} + \Phi_1 z_{t-s} - \phi_1 \Phi_1 z_{t-s-1} - \phi_2 \Phi_1 z_{t-s-2} + a_t$
d) $z_t = C - \phi_1 z_{t-1} - \phi_2 z_{t-2} - \Phi_1 z_{t-s} + \phi_1 \Phi_1 z_{t-s-1} + \phi_2 \Phi_1 z_{t-s-2} + a_t$
e) $z_t = C + \phi_1 z_{t-1} + \phi_2 z_{t-2} + \Phi_1 z_{t-s} - \phi_1 \Phi_1 z_{t-1} z_{t-s} - \phi_2 \Phi_1 z_{t-2} z_{t-s} + a_t$
f) $z_t = C - \phi_1 z_{t-1} - \phi_2 z_{t-2} - \Phi_1 z_{t-s} - \phi_1 \Phi_1 z_{t-1} z_{t-s} - \phi_2 \Phi_1 z_{t-2} z_{t-s} + a_t$
g) $z_t = C + \phi_1 z_{t-1} + \phi_2 z_{t-2} + \Phi_1 z_{t-s} + \phi_1 \Phi_1 z_{t-1} z_{t-s} + \phi_2 \Phi_1 z_{t-2} z_{t-s} + a_t$
h) $z_t = C - \phi_1 z_{t-1} - \phi_2 z_{t-2} - \Phi_1 z_{t-s} + \phi_1 \Phi_1 z_{t-1} z_{t-s} + \phi_2 \Phi_1 z_{t-2} z_{t-s} + a_t$

Problem 13. If you difference a series and then observe that the sample ACF of the differenced series decays very slowly, what should you do?

a) Conclude that the series has been over-differenced.
b) Try a transformation, perhaps a log or square root.
c) Use a mixed model with both $p > 0$ and $q > 0$.
d) Conclude that the series is non-invertible.
e) Try differencing the series again.
f) Use an MA(q) model with a large value of q.

Problem 14. Suppose the conditional distribution of X given the information $\mathcal{I}$ is

$$\text{Normal with mean} = E(X \,|\, \mathcal{I}) \text{ and variance} = \text{Var}(X \,|\, \mathcal{I}),$$

and we are using the squared error loss function. Then our best forecast of X is ________

a) $E(X \,|\, \mathcal{I})$ b) $\text{Var}(X \,|\, \mathcal{I})$ c) $X - \widehat{X}$ d) $E[(X - \widehat{X})^2 \,|\, \mathcal{I}]$
e) $E\left(|X - \widehat{X}| \,|\, \mathcal{I}\right)$ f) $\sqrt{\text{Var}(X \,|\, \mathcal{I})}$ g) $(\widehat{X} - 1.96\,\text{SE}, \widehat{X} + 1.96\,\text{SE})$

Problem 15. The theoretical **I**ACF of an AR(p) process ________

a) is the same as the **P**ACF of an MA(p) process.
b) is the same as the ACF of an MA(p) process.
c) is the same as the ACF of an AR(p) process.
d) eventually decays to zero (perhaps in a complicated way).
e) decays to zero very slowly.
f) gets closer and closer to a non-zero limiting value for large lags.
g) converges to a value depending mainly on the last few observed values.

The next three problems involve this situation: Suppose

$$\begin{aligned} v(B) &= \frac{B^b\omega(B)}{\delta(B)} \quad \text{with} \\ \omega(B) &= \omega_0 - \omega_1 B - \omega_2 B^2 - \cdots - \omega_h B^h \quad \text{and} \\ \delta(B) &= \delta_0 - \delta_1 B - \delta_2 B^2 - \cdots - \delta_r B^r \,. \end{aligned}$$

Problem 16. If $r = 1$, then the **first** non-zero v-weight is at lag ________.

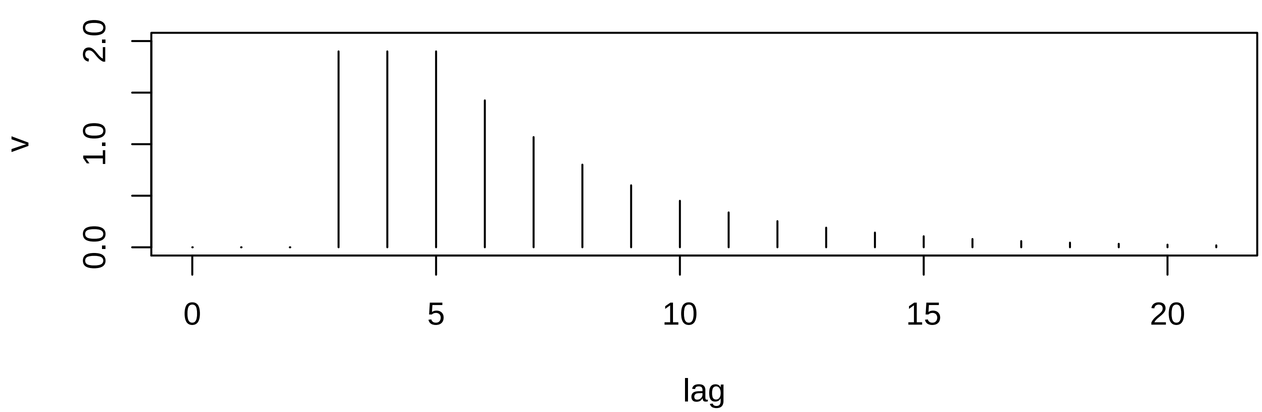
a) $b+1$ **b**) $b+h$ **c**) $b+h+1$ **d**) $b-1$ **e**) b
f) $b+h-1$ **g**) h **h**) $h-1$ **i**) $h+1$ **j**) $b-h+1$

Problem 17. If $r = 0$, then the **last** non-zero v-weight is at lag ________.

a) b **b**) h **c**) $b-h$ **d**) $b+h$ **e**) $h-b$ **f**) bh **g**) b/h **h**) h/b

Problem 18. What is the value of h for the transfer function with v-weights given in the plot below?

a) 0 **b**) 1 **c**) 2 **d**) 3 **e**) 4 **f**) 5 **g**) 6



Problem 19. Suppose $w_t = \nabla^2 z_t$. If w_t appears to be stationary, and the sample ACF of w_t has a single large spike at lag 1 followed by much smaller non-significant spikes, then a reasonable model for the original series z_t is ________

a) ARIMA(1,1,0) **b**) ARIMA(0,1,1) **c**) ARIMA$(0,0,1)_2$ **d**) ARIMA$(1,0,0)_2$
e) ARIMA(1,2,0) **f**) ARIMA(0,2,1) **g**) ARIMA(0,1,2) **h**) ARIMA(2,1,0)

Problem 20. For a time series with a non-stationary mean, it is common for the **P**ACF to _________

a) decay very slowly.

b) have a single large spike at lag 1 with $\hat{\phi}_{11}$ close to 1.

c) have several large spikes followed by an approximate cutoff to zero.

d) display strong sinusoidal oscillations.

e) decay exponentially.

f) exhibit alternating exponential decay.

g) exhibit variability which changes with the level.

Problem 21. To estimate the transfer function model

$$Y_t = C + \frac{B^3\omega_0}{1-\delta_1 B}X_t + \frac{1}{(1-\phi_{1,1}B)(1-\phi_{2,1}B^{12})}a_t\,,$$

you use the SAS code _________.

a) ESTIMATE INPUT=(3$/(1)X) P=(1)(12) ;

b) ESTIMATE INPUT=(3$/(1)X) P=(1,12) ;

c) ESTIMATE INPUT=(3$(0)/(0,1)X) P=(1)(12) ;

d) ESTIMATE INPUT=(3$(0)/(0,1)X) P=(1,12) ;

e) ESTIMATE INPUT=(3$(0)/(0,1)X) Q=(1,12) ;

f) ESTIMATE INPUT=($(3)/(0,1)X) Q=(1)(12) ;

g) ESTIMATE INPUT=($(3)/(1)X) Q=(1,12) ;

h) ESTIMATE INPUT=($(3)/(1)X) P=(1)(12) ;

Problem 22. Suppose z_t is a stationary ARMA process with psi-weights $\psi_1, \psi_2, \psi_3, \ldots$ Let $e_n(3) = z_{n+3} - \hat{z}_{n+3}$ be the 3-step-ahead forecast error based on information about the series up to time n. The forecast error $e_n(3)$ is equal to _________.

a) $\sigma_a^2(1+\psi_1^2+\psi_2^2)$

b) $\sigma_a^2(1+\psi_1^2+\psi_2^2+\psi_3^2)$

c) $\sigma_a\sqrt{1+\psi_1^2+\psi_2^2}$

d) $\sigma_a\sqrt{1+\psi_1^2+\psi_2^2+\psi_3^2}$

e) $a_n + \psi_1 a_{n-1} + \psi_2 a_{n-2}$

f) $a_{n+3} + \psi_1 a_{n+2} + \psi_2 a_{n+1}$

g) $a_{n+3} + \psi_1 a_{n+2} + \psi_2 a_{n+1} + \psi_3 a_n$

h) $a_n + \psi_1 a_{n-1} + \psi_2 a_{n-2} + \psi_3 a_{n-3}$

Problem 23. Suppose we start with the series x_t, then calculate $y_t = \nabla x_t$, and then $z_t = \nabla_s y_t$. We find that $z_t =$ _________.

a) $x_{t-1} - x_t - x_{t-s-1} + x_{t-s}$

b) $x_t + x_{t-1} - x_{t-s} - x_{t-s-1}$

c) $x_t - x_{t-1} - x_{t-s} + x_{t-s-1}$

d) $x_t - x_{t+1} - x_{t+s} + x_{t+s+1}$

e) $x_{t-1} + x_t - x_{t+s+1} + x_{t+s}$

f) $x_t + x_{t+1} - x_{t+s} - x_{t+s+1}$

Problem 24. A stationary ARMA process z_t with psi-weights $\psi_1, \psi_2, \psi_3, \ldots$ can be written as _________.

a) $z_t = \mu_z + \dfrac{1}{1 - \psi_1 B - \psi_2 B^2 - \psi_3 B^3 - \ldots} a_t$

b) $z_t = C + a_t + \dfrac{\omega_0 - \omega_1 B - \omega_2 B^2 - \omega_3 B^3 - \ldots}{1 - \psi_1 B - \psi_2 B^2 - \psi_3 B^3 - \ldots} z_t$

c) $z_t = C + \dfrac{1 - \psi_1 B - \psi_2 B^2 - \psi_3 B^3 - \ldots}{1 - \delta_1 B - \delta_2 B^2 - \delta_3 B^3 - \ldots} a_t$

d) $z_t = C + a_t + \psi_1 z_{t-1} + \psi_2 z_{t-2} + \psi_3 z_{t-3} + \ldots$

e) $z_t = \mu_z + a_t + \psi_1 a_{t+1} + \psi_2 a_{t+2} + \psi_3 a_{t+3} + \ldots$

f) $z_t = \mu_z + a_t + \psi_1 a_{t-1} + \psi_2 a_{t-2} + \psi_3 a_{t-3} + \ldots$

g) $z_t = C + a_t + \psi_1 z_{t+1} + \psi_2 z_{t+2} + \psi_3 z_{t+3} + \ldots$

Problem 25. If we form a new series w_t by differencing the series x_t 3 times at lag 1 and then 4 times at lag 6, we may write $w_t =$ _________.

a) $(1 - B^3)(1 - B^4)^6 x_t$

b) $(1 - B^3)(1 - B^6)^4 x_t$

c) $(1 - B)^4(1 - B^6)^3 x_t$

d) $(1 - B)^4(1 - B^3)^6 x_t$

e) $(1 - B^6)(1 - B^3)^4 x_t$

f) $(1 - B^6)(1 - B^4)^3 x_t$

g) $(1 - B)^3(1 - B^6)^4 x_t$

h) $(1 - B)^3(1 - B^4)^6 x_t$

Problem 26. The ACF and PACF of a stationary ARIMA$(p, 0, q)(P, 0, Q)_8$ process is given on the next page. What is this process?

a) ARIMA$(2, 0, 0)(1, 0, 0)_8$ **b)** ARIMA$(1, 0, 0)(0, 0, 2)_8$ **c)** ARIMA$(1, 0, 0)(2, 0, 0)_8$

d) ARIMA$(0, 0, 2)(0, 0, 1)_8$ **e)** ARIMA$(2, 0, 0)(0, 0, 1)_8$ **f)** ARIMA$(0, 0, 2)(1, 0, 0)_8$

g) ARIMA$(0, 0, 1)(0, 0, 2)_8$ **h)** ARIMA$(0, 0, 1)(2, 0, 0)_8$ **i)** ARIMA$(0, 0, 2)(2, 0, 0)_8$

LAG	ACF	PACF	PSI	PI
1	-0.593939	-0.593939	-0.700000	-0.700000
2	0.242424	-0.170478	0.400000	-0.090000
3	0.0	0.107058	0.0	0.217000
4	0.0	0.139839	0.0	0.187900
5	0.0	0.056075	0.0	0.044730
6	0.145455	0.223094	0.0	-0.043849
7	-0.356364	-0.297598	0.0	-0.048586
8	0.600000	0.381590	0.600000	0.583529
9	-0.356364	0.340515	-0.420000	0.427905
10	0.145455	0.106021	0.240000	0.066122
11	0.0	-0.059646	0.0	-0.124877
12	0.0	-0.083460	0.0	-0.113862
13	0.0	-0.034765	0.0	-0.029753
14	0.087273	0.009001	0.0	0.024718
15	-0.213818	0.020196	0.0	0.029204
16	0.360000	0.010539	0.360000	0.010555
17	-0.213818	-0.000700	-0.252000	-0.004293
18	0.087273	-0.004706	0.144000	-0.007227
19	0.0	-0.003014	0.0	-0.003342
20	0.0	-0.000227	0.0	0.000552
21	0.0	0.001046	0.0	0.001723
22	0.052364	0.000823	0.0	0.000985
23	-0.128291	0.000158	0.0	0.000001
24	0.216000	-0.000219	0.216000	-0.000394
25	-0.128291	-0.000216	-0.151200	-0.000276
26	0.052364	-0.000064	0.086400	-0.000036
27	0.0	0.000042	0.0	0.000085
28	0.0	0.000055	0.0	0.000074
29	0.0	0.000022	0.0	0.000018
30	0.031418	-0.000007	0.0	-0.000017
31	-0.076975	-0.000013	0.0	-0.000019
32	0.129600	-0.000007	0.129600	-0.000006
33	-0.076975	0.000001	-0.090720	0.000003
34	0.031418	0.000003	0.051840	0.000005
35	0.0	0.000002	0.0	0.000002
36	0.0	0.0	0.0	0.0
37	0.0	-0.000001	0.0	-0.000001
38	0.018851	-0.000001	0.0	-0.000001
39	-0.046185	0.0	0.0	0.0
40	0.077760	0.0	0.077760	0.0

Problem 27. In addition to the ACF and PACF, the table on the previous page also has columns giving the ψ-weights and π-weights (PSI and PI). Is the ARMA process described in the table **invertible**? And why?

a) Yes, because the ψ-weights are decaying to zero.

b) Yes, because the π-weights are decaying to zero.

c) Yes, because the ACF is decaying to zero.

d) No, because the ψ-weights are decaying to zero.

e) No, because the π-weights are decaying to zero.

f) No, because the ACF is decaying to zero.

The last page of the exam contains some bits of PROC ARIMA output obtained from fitting a model to a time series y_t with 84 observations. Use this output to answer the following questions.

Problem 28. What is the estimated model?

a) $(1 - 0.34695B - 0.35167B^2)(1 - B^{12})y_t = (1 - 0.52048B^{12})a_t$

b) $(1 - 0.34695B - 0.35167B^2)(1 - B)y_t = (1 - 0.52048B)a_t$

c) $(1 - 0.34695B - 0.35167B^2)y_t = (1 - 0.52048B^{12})a_t$

d) $(1 - 0.34695B - 0.35167B^2)(1 - B^{12})y_t = 0.086079 + (1 - 0.52048B^{12})a_t$

e) $(1 - 0.34695B - 0.35167B^2)(1 - B)y_t = 0.086079 + (1 - 0.52048B)a_t$

f) $(1 - 0.34695B - 0.35167B^2)y_t = 0.086079 + (1 - 0.52048B^{12})a_t$

g) $(1 - 0.34695B - 0.35167B^2)(1 - B)^{12}y_t = 0.086079 + (1 - 0.52048B)a_t$

Problem 29. What is the standard error (that is, the square root of the variance) of the one-step-ahead prediction error?

a) 0.17182 **b)** 0.221759 **c)** 0.03657 **d)** 0.13629 **e)** 0.11029 **f)** 0.11058 **g)** 0.1819

Problem 30. As you predict further and further into the future, the long-range forecasts from this model converge to _________.

a) a straight line with a nonzero slope

b) the estimated mean of the process

c) a repeating pattern added to a straight line with nonzero slope

d) a repeating pattern

e) a value which depends mainly on the last few observed values

Name of Variable = y	
Period(s) of Differencing	12
Mean of Working Series	0.288627
Standard Deviation	0.221759
Number of Observations	72
Observation(s) eliminated by differencing	12

Maximum Likelihood Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MU	0.28562	0.03657	7.81	<.0001	0
MA1,1	0.52048	0.13629	3.82	0.0001	12
AR1,1	0.34695	0.11029	3.15	0.0017	1
AR1,2	0.35167	0.11058	3.18	0.0015	2

Constant Estimate	0.086079
Variance Estimate	0.029522
Std Error Estimate	0.17182
AIC	-41.0894
SBC	-31.9828
Number of Residuals	72

Forecasts for variable y				
Obs	Forecast	Std Error	95% Confidence Limits	
85	9.5783	0.1718	9.2415	9.9150
86	9.7548	0.1819	9.3984	10.1113
87	10.2862	0.1991	9.8959	10.6765
88	10.0286	0.2051	9.6267	10.4306
89	9.9509	0.2101	9.5391	10.3627