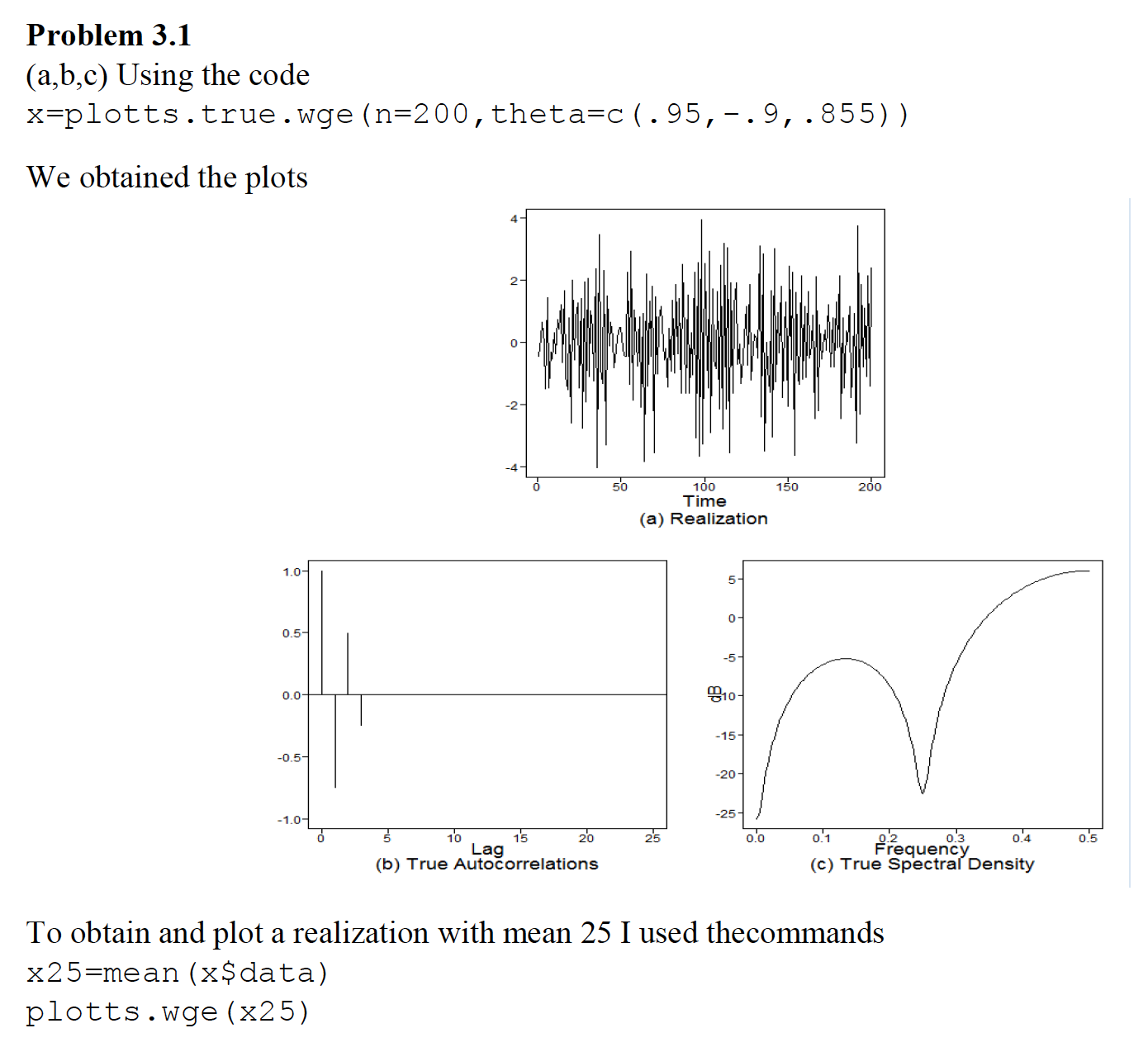
DS 6373: Time Series: Unit 5 HW Solutions

Below are the homework (HW) problems for this Unit. You do not need to submit the solutions rather double check your solutions to the solutions posted. Solutions will be posted to the Wall a few days after the release of the HW. This is intended to let the student think about the problem and attempt it without the temptation to first look at the solution. Please write any questions to the Wall or in an email to myself and/or bring them up during office hours or even in the next Live Session. Remember that the concepts covered below are fundamental to the course and are fair game for the midterm and final.

Have a blast!

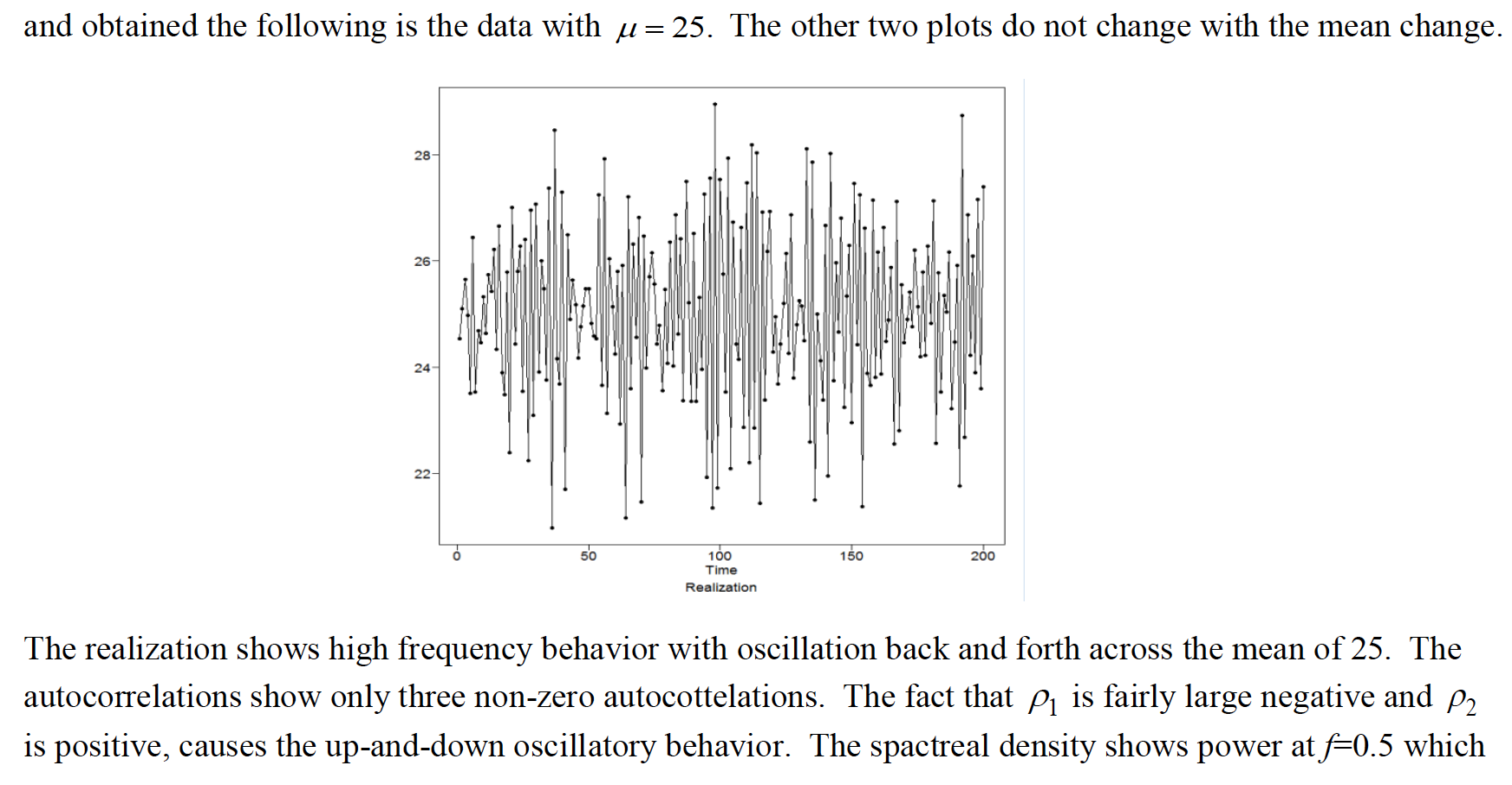
Problems from Chapter 3 of the Textbook:

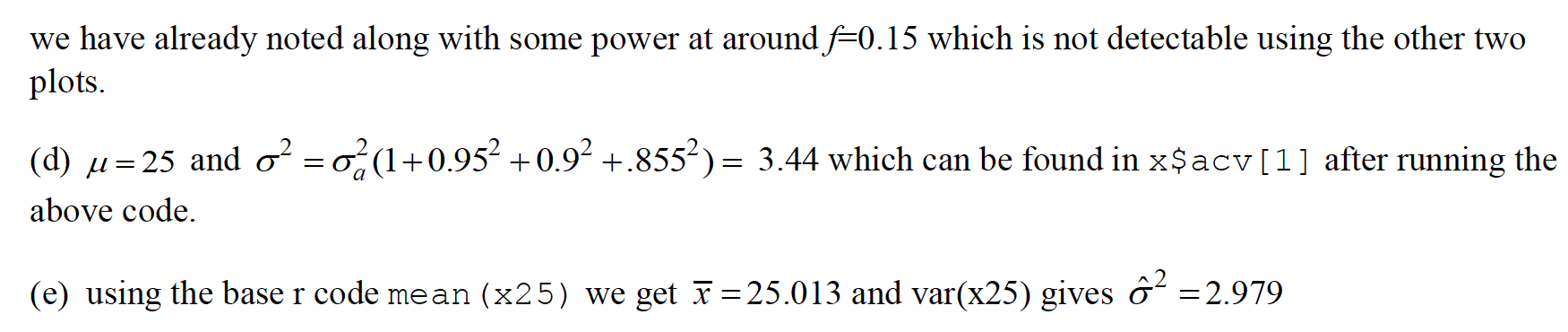
3.1



X25 = x$data + 25

plotts.wge(x25)

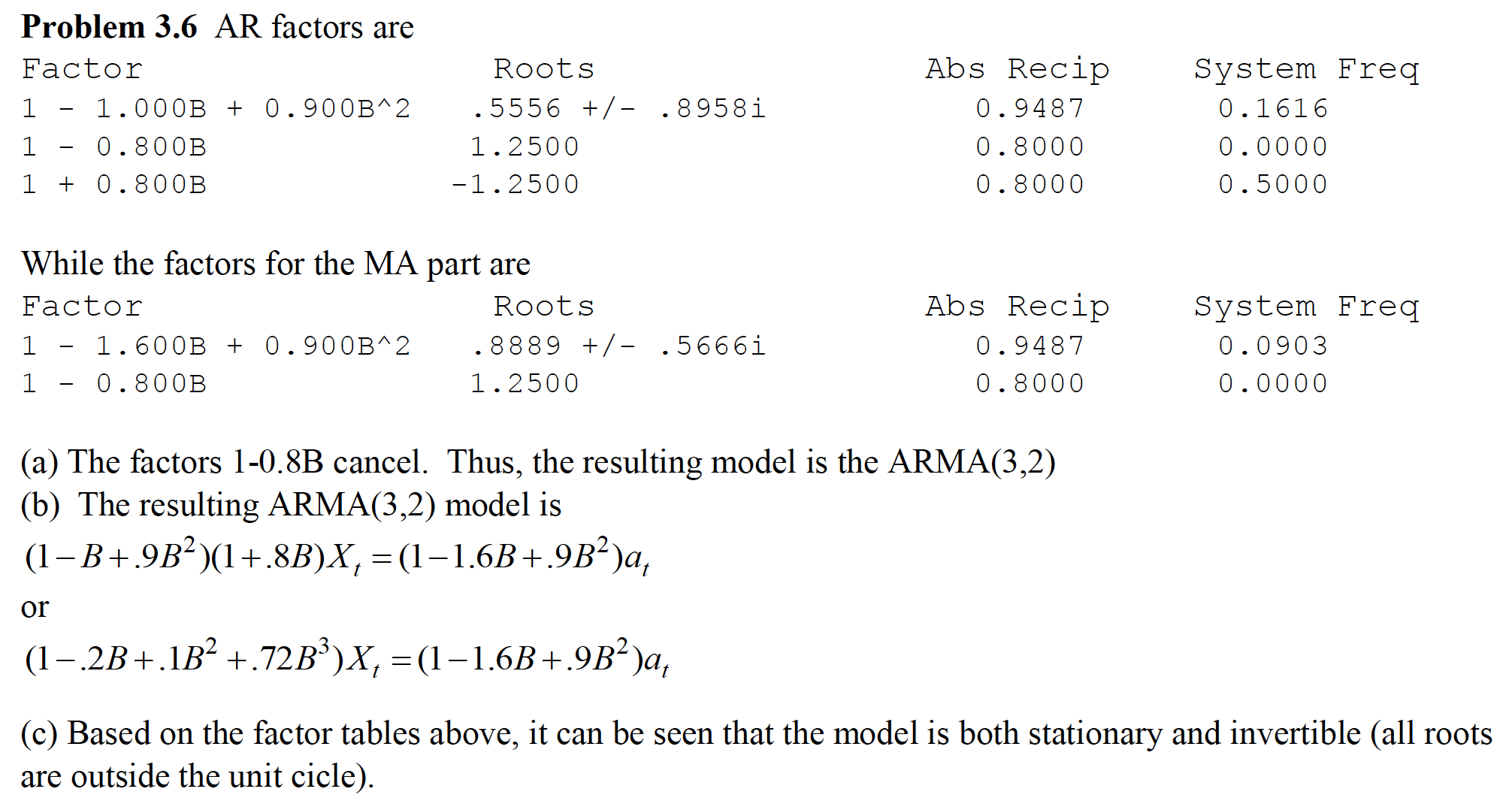




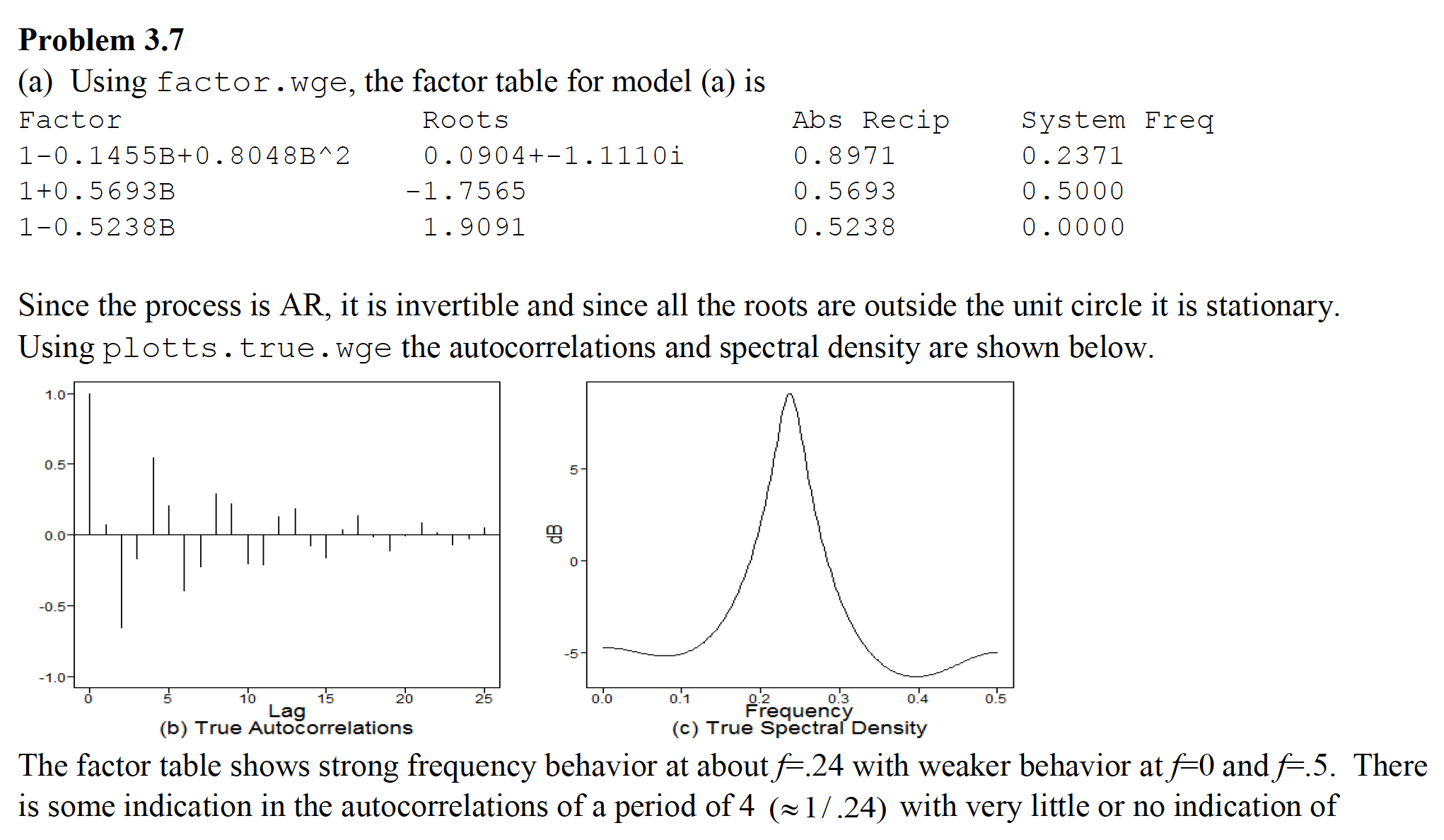
3.3 (c)

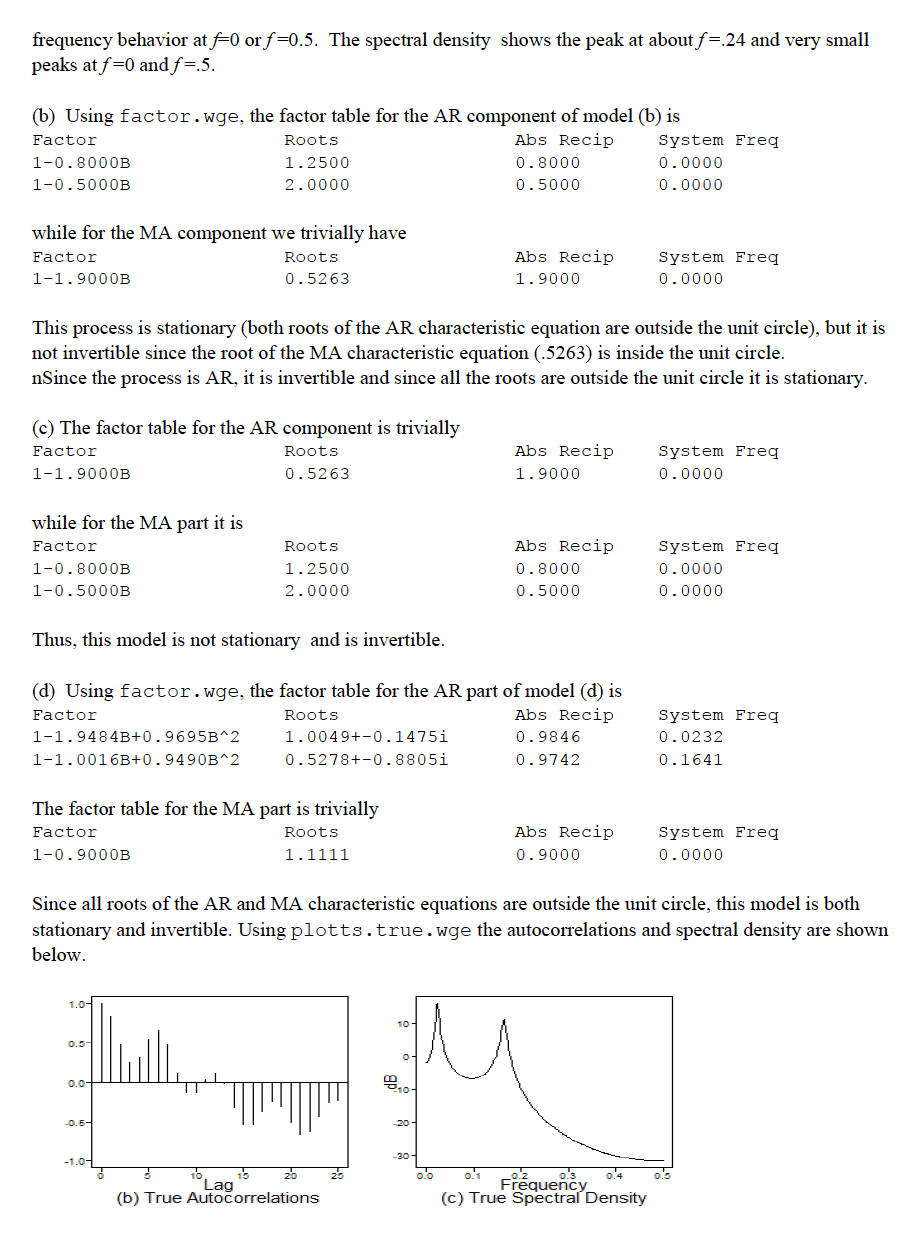
This is a moving average model which is always stationary since it is a linear combination of white noise terms which are individually stationary. All moving average models are stationary, they may not be invertible, but they are stationary.

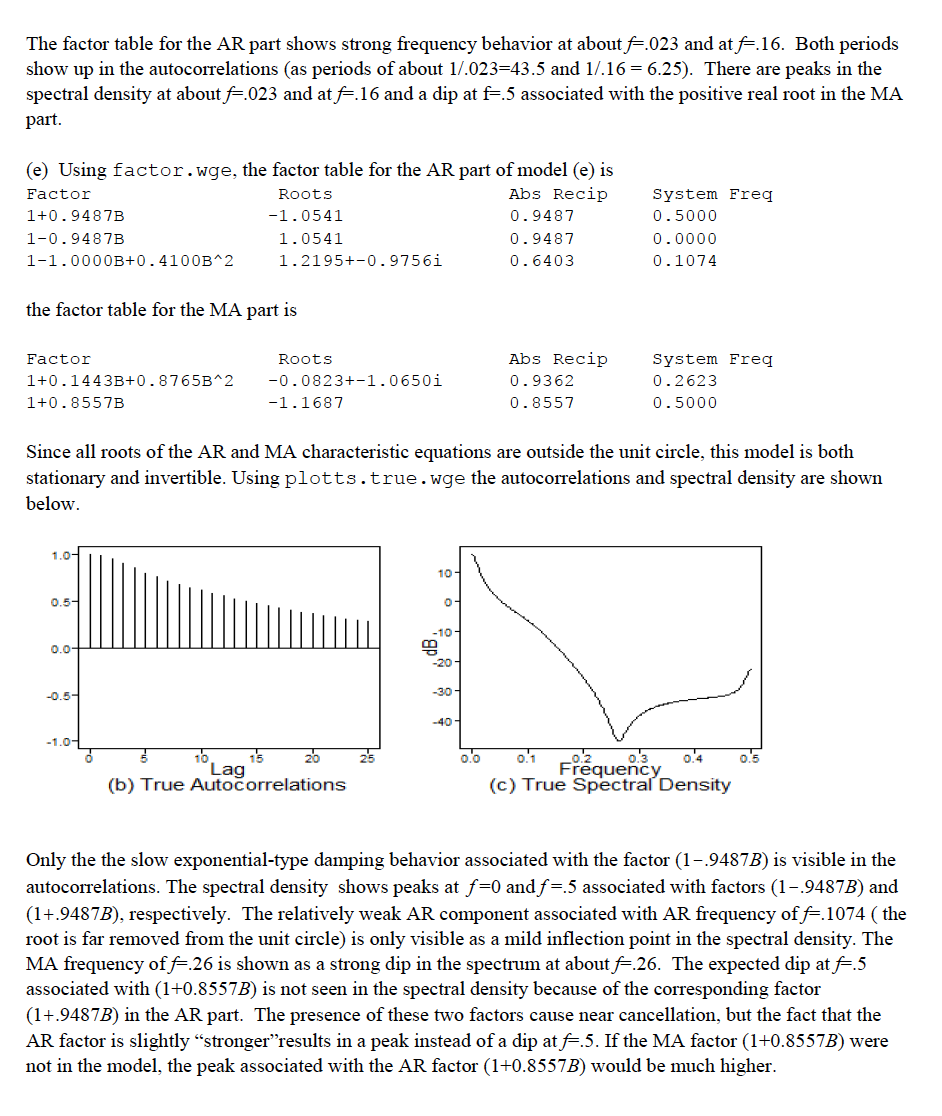
3.6



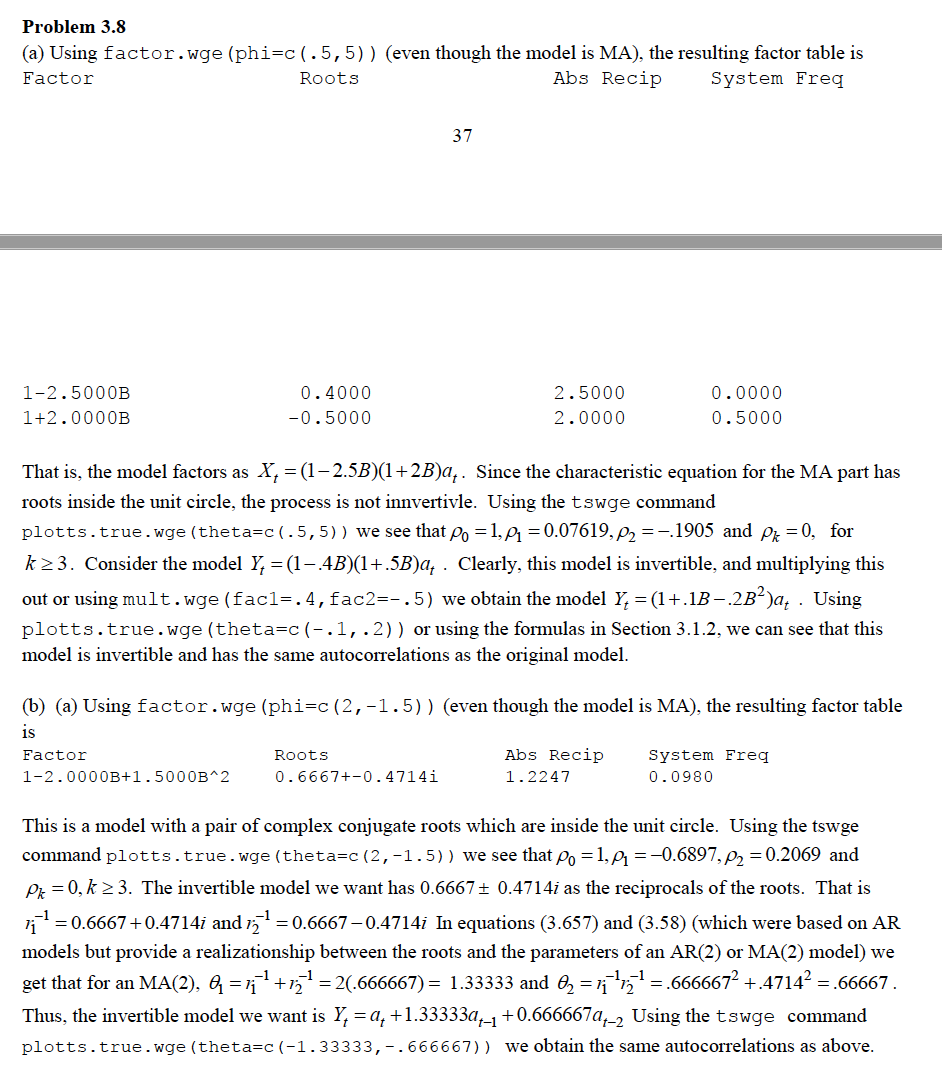
3.7







3.8



Text, letter

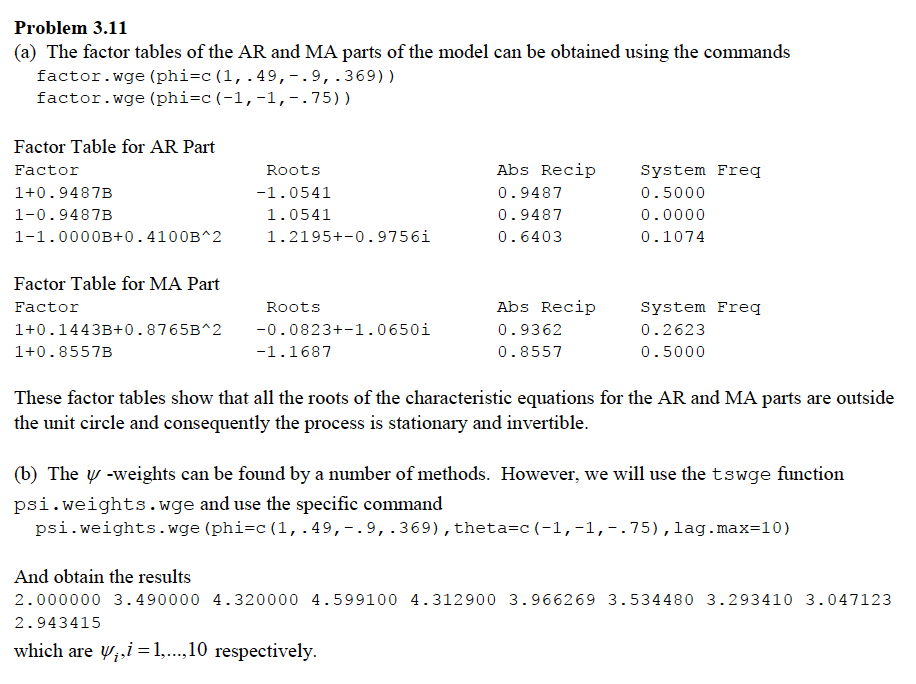
Description automatically generated

This is a model with a pair of complex conjugate roots which are inside the unit circle. Using the tswge command plotts.true.wge(theta = c(2,-1.5)) we see that and -0.6897, 0.2069 and . The invertible model we want has as the reciprocals of the roots. That is and . In equation (3.57) and (3.58) (which were based on AR models but provide a relationship between the roots and the parameters of an AR(2) or MA(2) model) we get that for an MA(2), = 1.33333 and -.6666667. Thus, the invertible model we want is

.

Using the tswge command plotts.true.wge(theta = c(1.333333,-.666667)) we obtain the same autocorrelations as above.

3.11



3.13: Just for (i)

