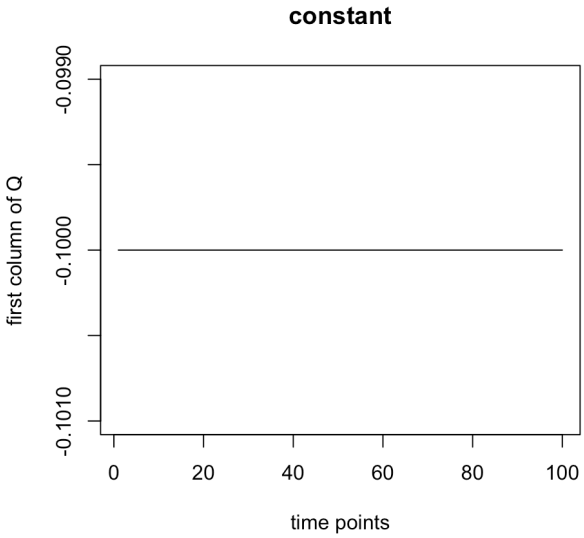
STAT571
HW#5
Tianqi Wu

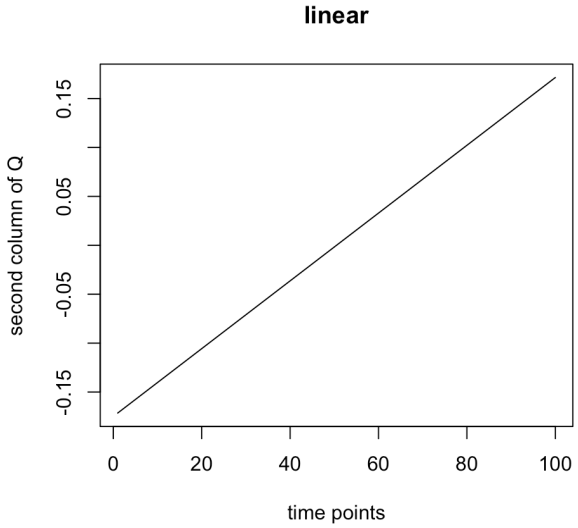
7.(a)

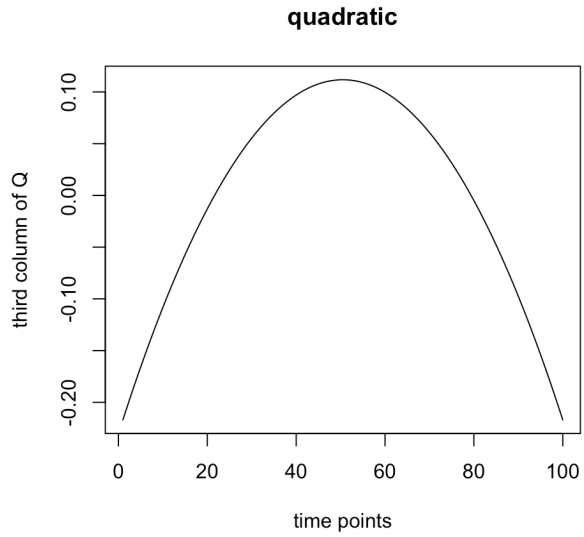
R matrix:

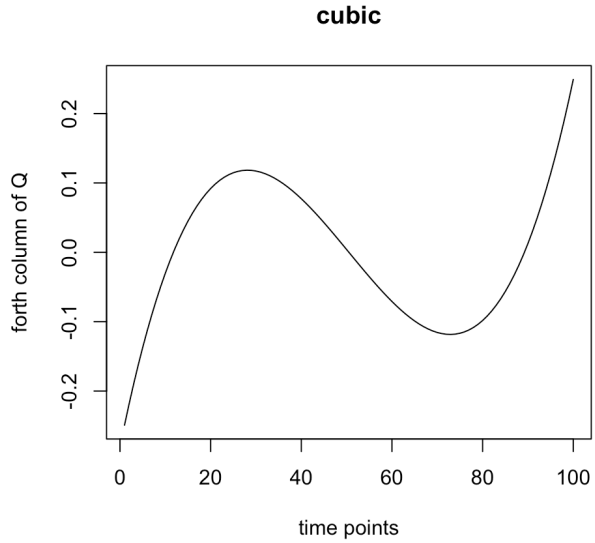
-10	-505.0000	-33835.000	-2550250.0
0	288.6607	29154.731	2641360.9
0	0.0000	-7451.696	-1128932.0
0	0.0000	0.000	188849.9

7.(b)


constant
first column of Q
-0.0990
-0.1000
-0.1010
0
20
40
60
80
100
time points


linear
second column of Q
0.15
0.05
-0.05
-0.15
0
20
40
60
80
100
time points


quadratic
third column of Q
0.10
0.00
-0.10
-0.20
0
20
40
60
80
100
time points


cubic
forth column of Q
0.2
0.1
0.0
-0.1
-0.2
0
20
40
60
80
100
time points

R code:

```
first = rep(1,100)
second = c(1:100)
cubic = matrix(c(first,second,second^2,second^3),nrow = 100, ncol = 4)
R = qr.R(qr(cubic))
Q = qr.Q(qr(cubic))
matplot(Q[1:100,1],type='l',
        ylab='first column of Q',xlab='time points',main='constant')
matplot(Q[1:100,2],type='l',
        ylab='second column of Q',xlab='time points',main='linear')
matplot(Q[1:100,3],type='l',
        ylab='third column of Q',xlab='time points',main='quadratic')
matplot(Q[1:100,4],type='l',
        ylab='forth column of Q',xlab='time points',main='cubic')
```