Multivariate HW05

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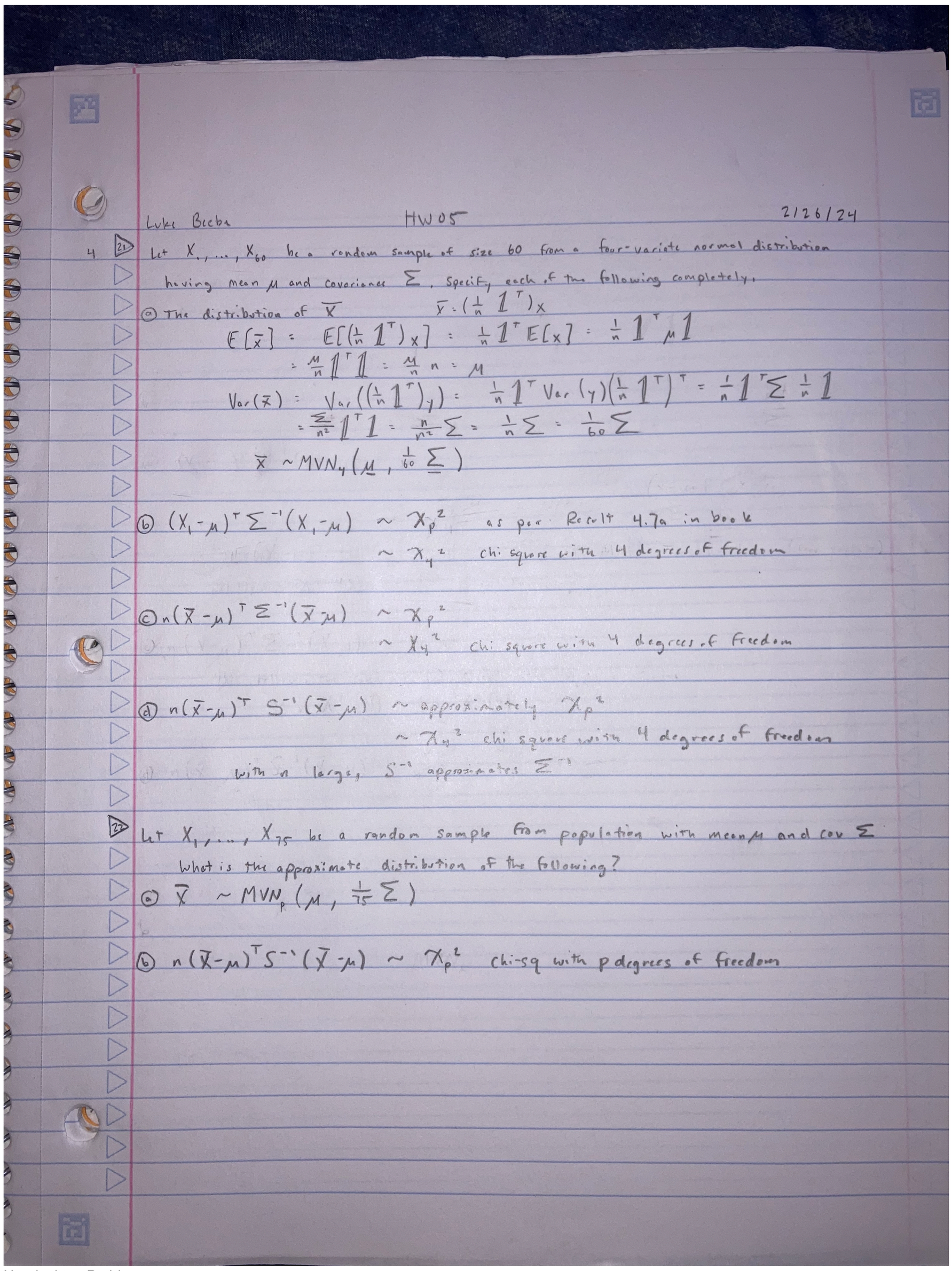
4.21 & 4.22



Handwritten Problems

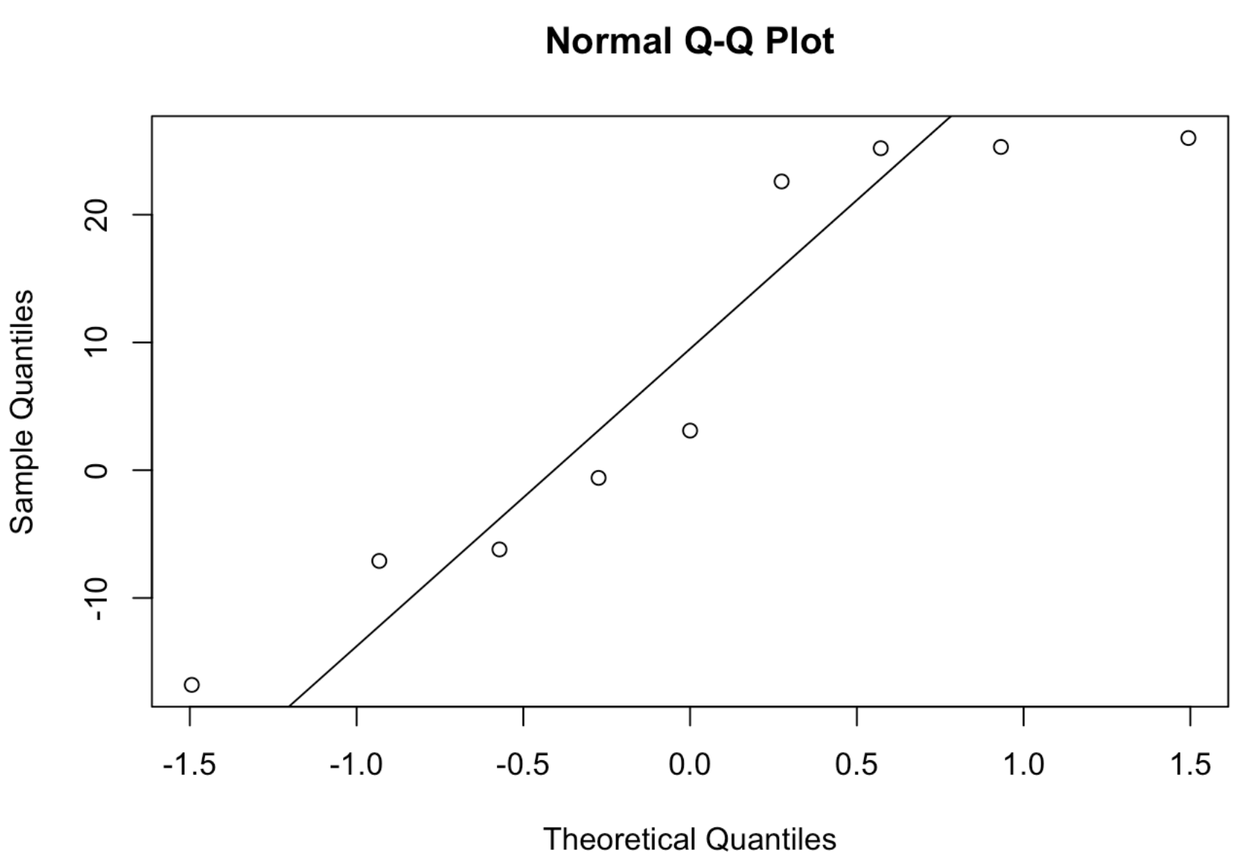
4.23

Consider the annual rates of return (including dividends) on the Dow-Jones industrial average for the years 1996-2005. These data, multiplied by 100, are

```
dow <- c(-0.6, 3.1, 25.3, -16.8, -7.1, -6.2, 25.2, 22.6, 26)
```

a. Construct a Q-Q plot. Do the data seem to be normally distributed? Explain.

```
qqnorm(dow)
qqline(dow)
```



It looks close to approximately normal. However, I am not entirely sure due to the departure at the top right of the screen from comparing quantile to quantile. With smaller sample sizes, this sometimes is the case, as there can be quite a bit of variability.

b. Carry out a test of normality based on the correlation coefficient rQ. Let the significance level be a=.10

```
p <- ((1:length(dow))-0.5)/length(dow)
q <- qnorm(p)
rQ <- cor(sort(dow), q)
rQ
```

```
## [1] 0.9351453
```

The critical value for a=0.1, n=5 is 0.9032. The critical value for a=0.1, n=10 is 0.9351. For this problem, a=0.1, n=9. So, the critical value < 0.9351, which our rQ statistic is at. Meaning, we do not reject the null.