

# am\_lab\_4

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## R Markdown

```
download.file("http://www.openintro.org/stat/data/bdims.RData", destfile = "bdims.RData")
load("bdims.RData")
head(bdims)
```

```
##   bia.di bii.di bit.di che.de che.di elb.di wri.di kne.di ank.di sho.gi che.gi
## 1   42.9   26.0   31.5   17.7   28.0   13.1   10.4   18.8   14.1  106.2   89.5
## 2   43.7   28.5   33.5   16.9   30.8   14.0   11.8   20.6   15.1  110.5   97.0
## 3   40.1   28.2   33.3   20.9   31.7   13.9   10.9   19.7   14.1  115.1   97.5
## 4   44.3   29.9   34.0   18.4   28.2   13.9   11.2   20.9   15.0  104.5   97.0
## 5   42.5   29.9   34.0   21.5   29.4   15.2   11.6   20.7   14.9  107.5   97.5
## 6   43.3   27.0   31.5   19.6   31.3   14.0   11.5   18.8   13.9  119.8   99.9
##   wai.gi nav.gi hip.gi thi.gi bic.gi for.gi kne.gi cal.gi ank.gi wri.gi age
## 1   71.5   74.5   93.5   51.5   32.5   26.0   34.5   36.5   23.5   16.5   21
## 2   79.0   86.5   94.8   51.5   34.4   28.0   36.5   37.5   24.5   17.0   23
## 3   83.2   82.9   95.0   57.3   33.4   28.8   37.0   37.3   21.9   16.9   28
## 4   77.8   78.8   94.0   53.0   31.0   26.2   37.0   34.8   23.0   16.6   23
## 5   80.0   82.5   98.5   55.4   32.0   28.4   37.7   38.6   24.4   18.0   22
## 6   82.5   80.1   95.3   57.5   33.0   28.0   36.6   36.1   23.5   16.9   21
##   wgt   hgt sex
## 1  65.6 174.0   1
## 2  71.8 175.3   1
## 3  80.7 193.5   1
## 4  72.6 186.5   1
## 5  78.8 187.2   1
## 6  74.8 181.5   1
```

```
#Since males and females tend to have different body dimensions, it will be useful to
create two additional data sets:
#one with only men and another with only women.``
mdims <- subset(bdims, sex == 1)
fdims <- subset(bdims, sex == 0)
```

.Now let's consider some of the other variables in the body dimensions data set. Using the figures at the end of the exercises, match the histogram to its normal probability plot. All of the variables have been standardized (first subtract the mean, then divide by the standard deviation), so the units won't be of any help. If you are uncertain based on these figures, generate the plots in R to check. (B,C,D)

- The histogram for female biiliac (pelvic) diameter ( `bii.di` ) belongs to normal probability plot letter **B**.
- The histogram for female elbow diameter ( `elb.di` ) belongs to normal probability plot letter **C**.
- The histogram for general age ( `age` ) belongs to normal probability plot letter **D**.
- The histogram for female chest depth ( `che.de` ) belongs to normal probability plot letter **A**.

.Note that normal probability plots C and D have a slight stepwise pattern. Why do you think this is the case?

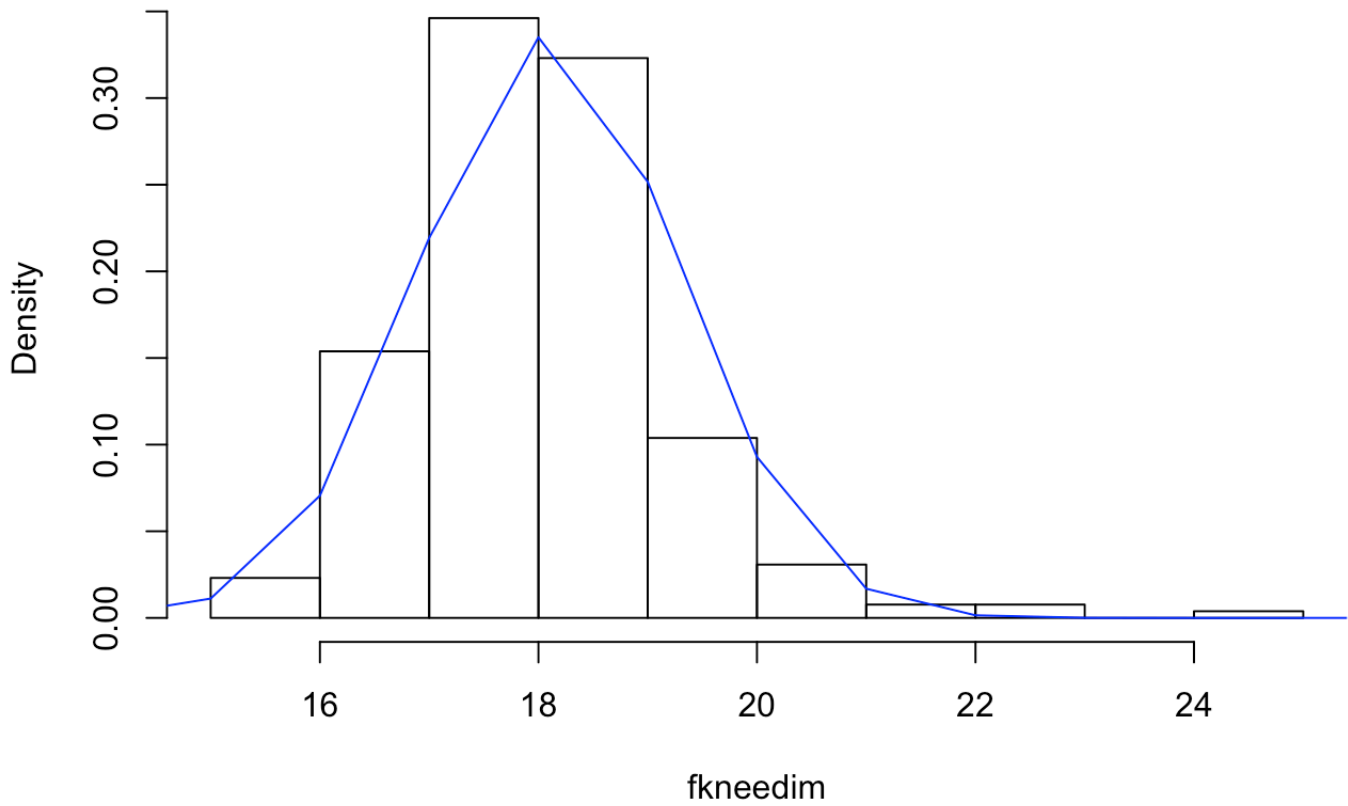
**Solution:** Probably data might be predictive data (choose randomly) which are picked randomly may cause the graph to get the stepwise pattern.

.As you can see, normal probability plots can be used both to assess normality and visualize skewness. Make a normal probability plot for female knee diameter ( `kne.di` ). Based on this normal probability plot, is this variable left skewed, symmetric, or right skewed? Use a histogram to confirm your findings.

**Solution:** Form the denity distribution plot and normal distribution plot, it is clear that the varibale is right skewed.

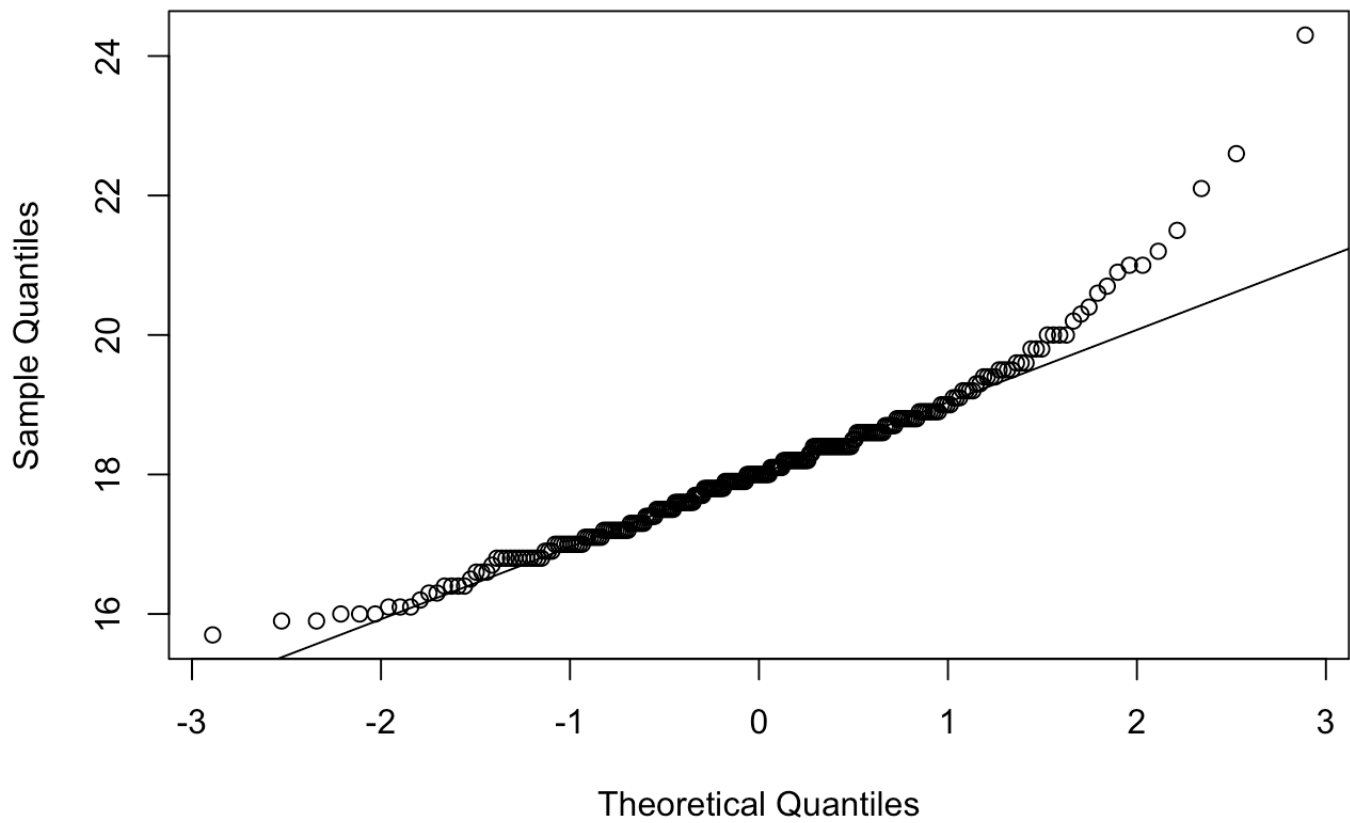
```
fkneedim <- fdims$kne.di
meanfknee <- mean(fkneedim)
sdfknee <- sd(fkneedim)
hist(fkneedim, probability = TRUE)
x <- 14:26
y <- dnorm(x = x, mean = meanfknee, sd = sdfknee)
lines(x = x, y = y, col = 'blue')
```

## Histogram of fkneedim



```
qqnorm(fdims$kne.di)  
qqline(fdims$kne.di)
```

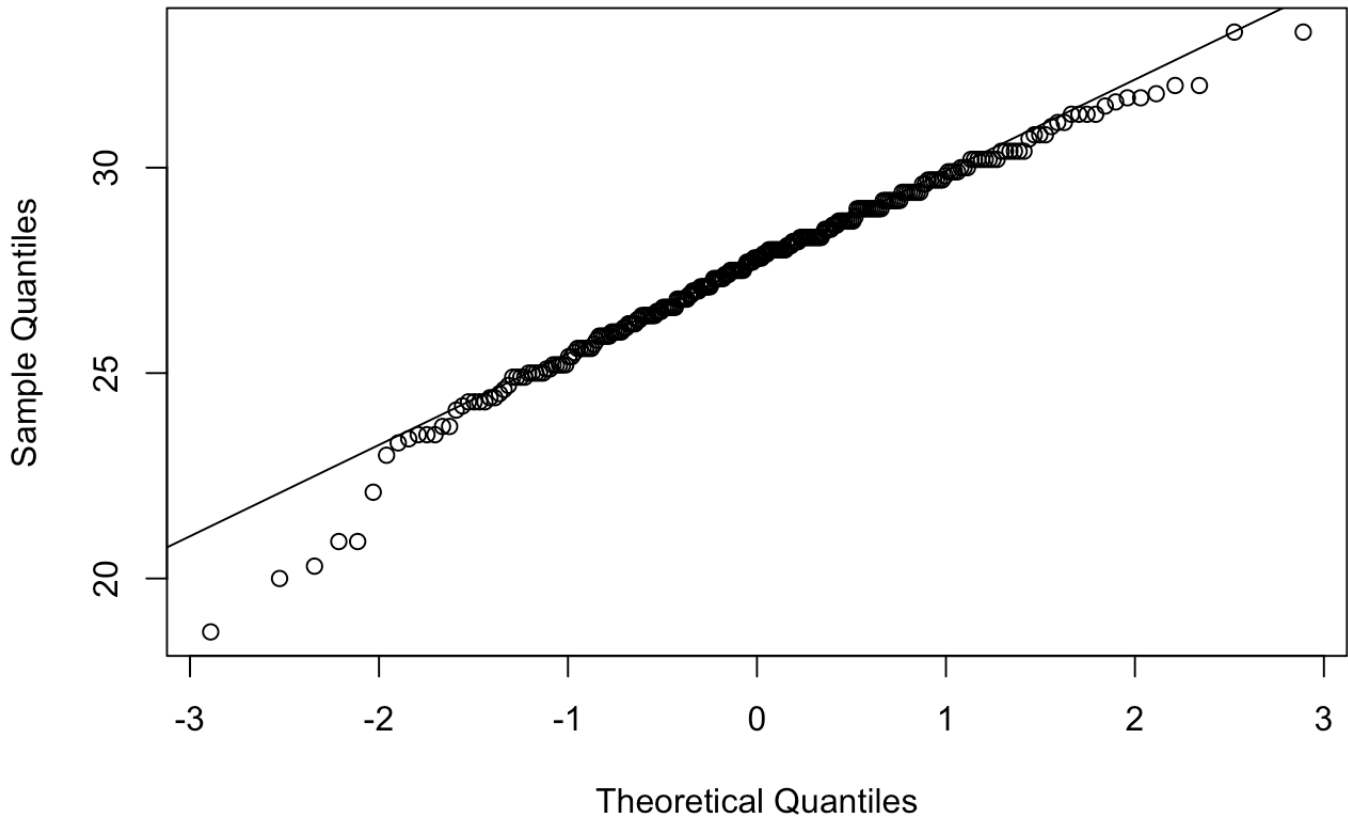
## Normal Q-Q Plot



Normal Probability Plots:

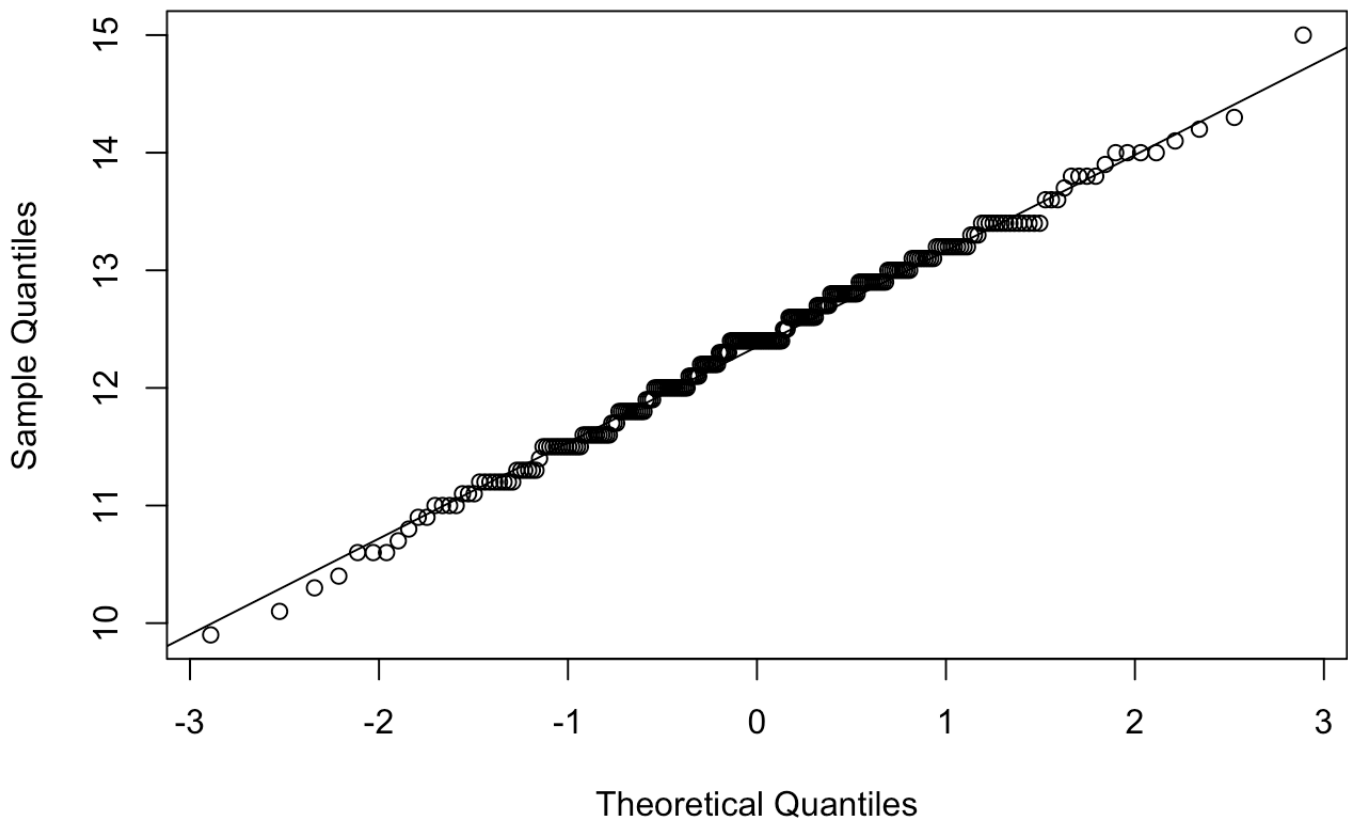
```
qqnorm(fdims$bii.di)  
qqline(fdims$bii.di)
```

## Normal Q-Q Plot



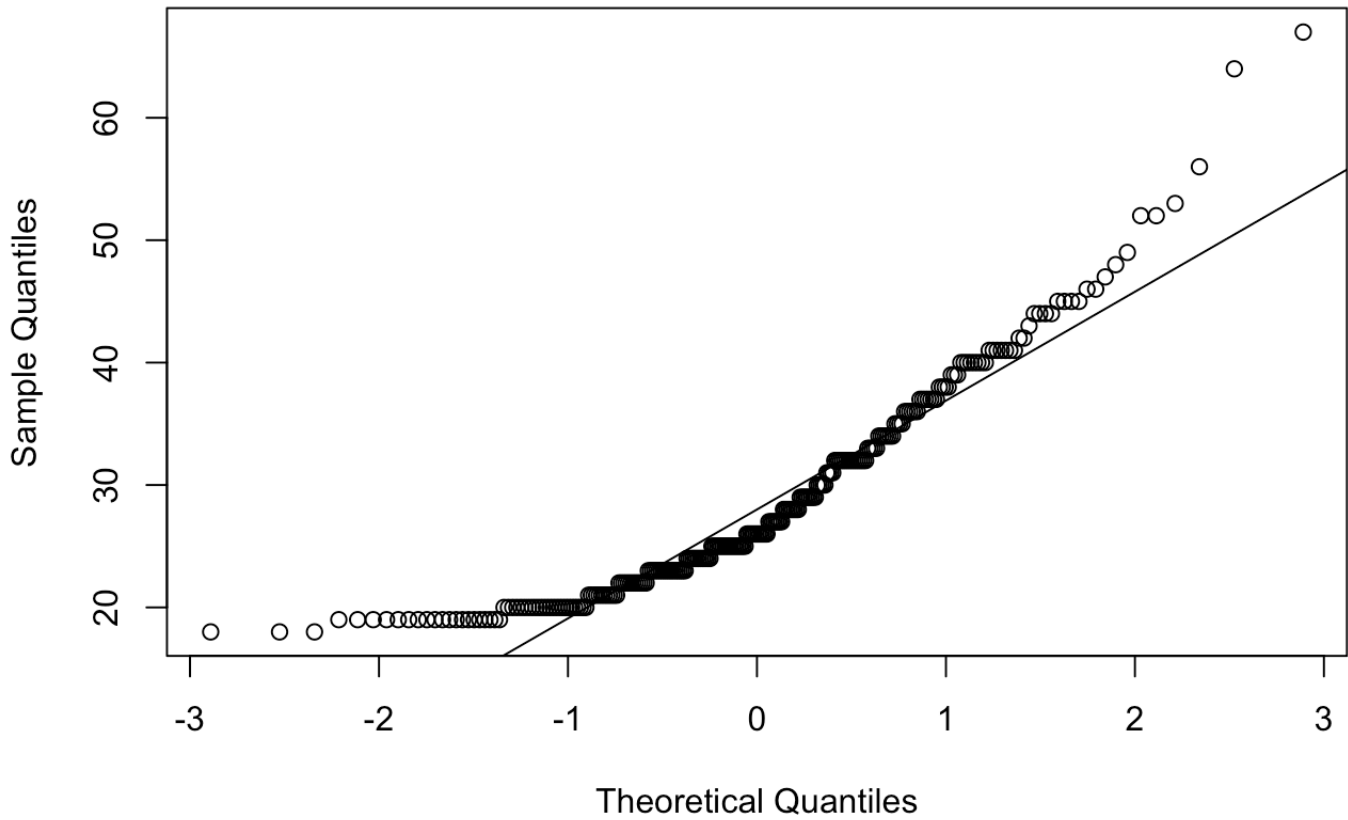
```
qqnorm(fdims$elb.di)  
qqline(fdims$elb.di)
```

## Normal Q-Q Plot



```
qqnorm(fdims$age)  
qqline(fdims$age)
```

## Normal Q-Q Plot



```
qqnorm(fdims$che.de)  
qqline(fdims$che.de)
```

## Normal Q-Q Plot

