

# Ch9 #55

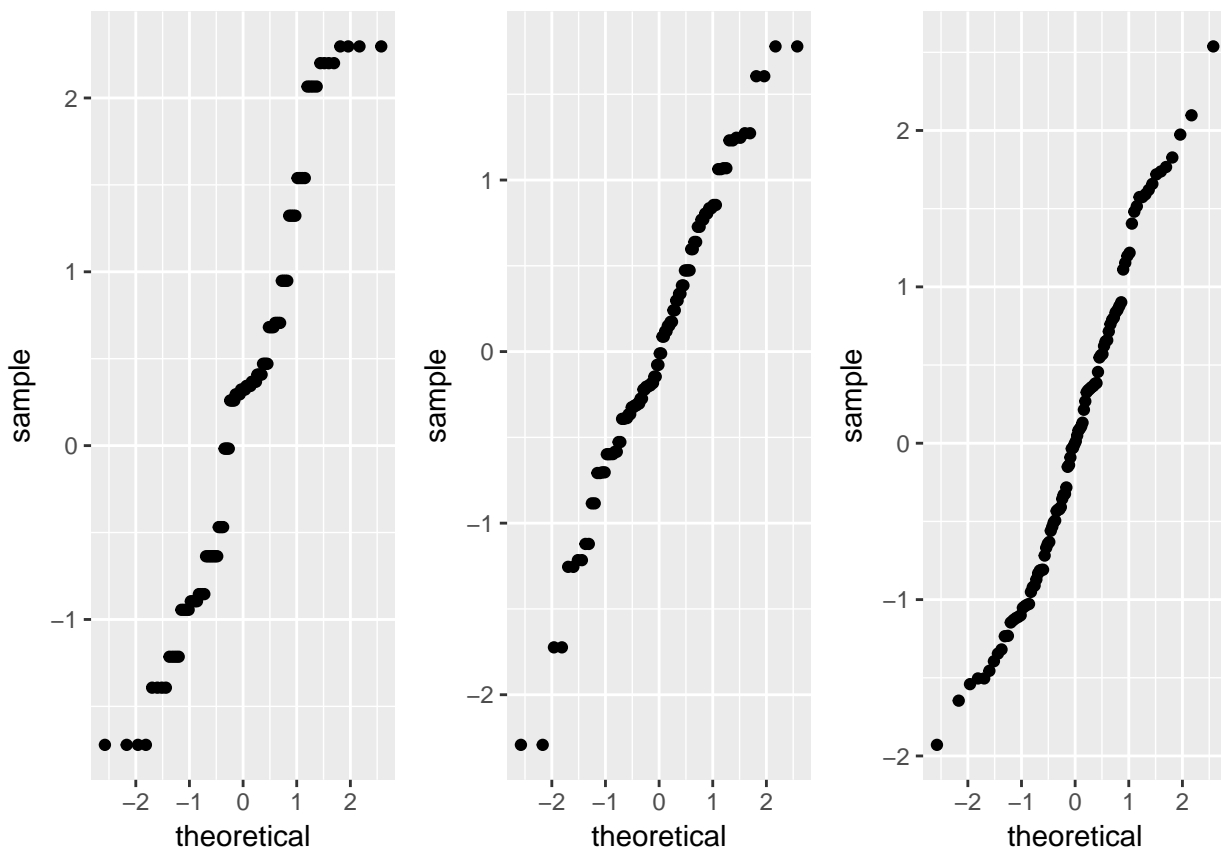
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3/16/2017

A)

```
library(ggplot2)
library(grid)
library(gridExtra)
# rnorm -> random number from normal distr
generator <- data.frame(first = rnorm(25, mean = 0, sd = 1),
                        second = rnorm(50, mean = 0, sd = 1),
                        third = rnorm(100, mean = 0, sd = 1))
# stat_qq and geom_qq build up sample and theoretical quantiles.
graph1 <- ggplot(generator) + geom_qq(aes(sample = first))
graph2 <- ggplot(generator) + geom_qq(aes(sample = second))
graph3 <- ggplot(generator) + geom_qq(aes(sample = third))

grid.arrange(graph1, graph2, graph3, ncol = 3) # multiplot works as well
```

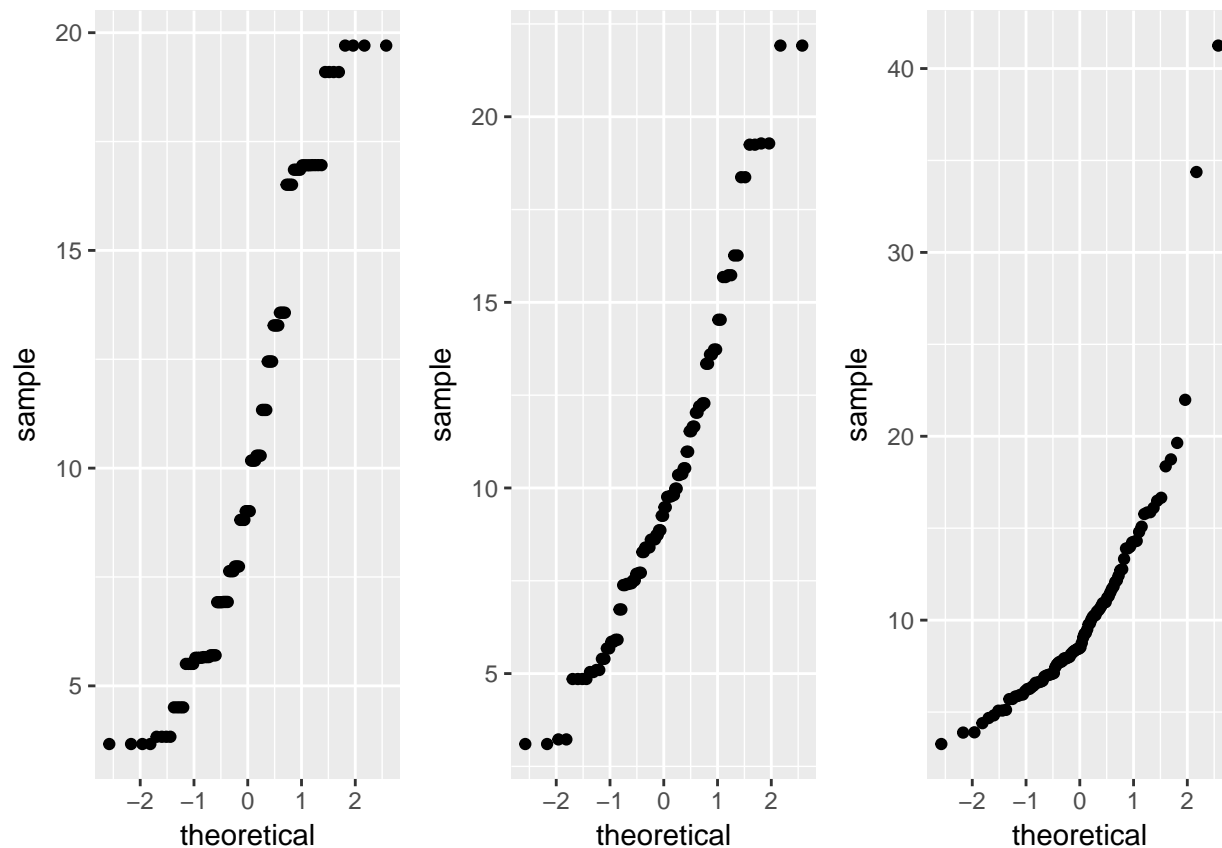


B)

```
# rchisq -> random number from chi-square dist
generator <- data.frame(first = rchisq(25, df = 10),
                        second = rchisq(50, df = 10),
                        third = rchisq(100, df = 10))
```

```
# stat_qq and geom_qq build up sample and theoretical quantiles.
graph1 <- ggplot(generator) + geom_qq(aes(sample = first))
graph2 <- ggplot(generator) + geom_qq(aes(sample = second))
graph3 <- ggplot(generator) + geom_qq(aes(sample = third))

grid.arrange(graph1, graph2, graph3, ncol = 3) # multiplot works as well
```



C)

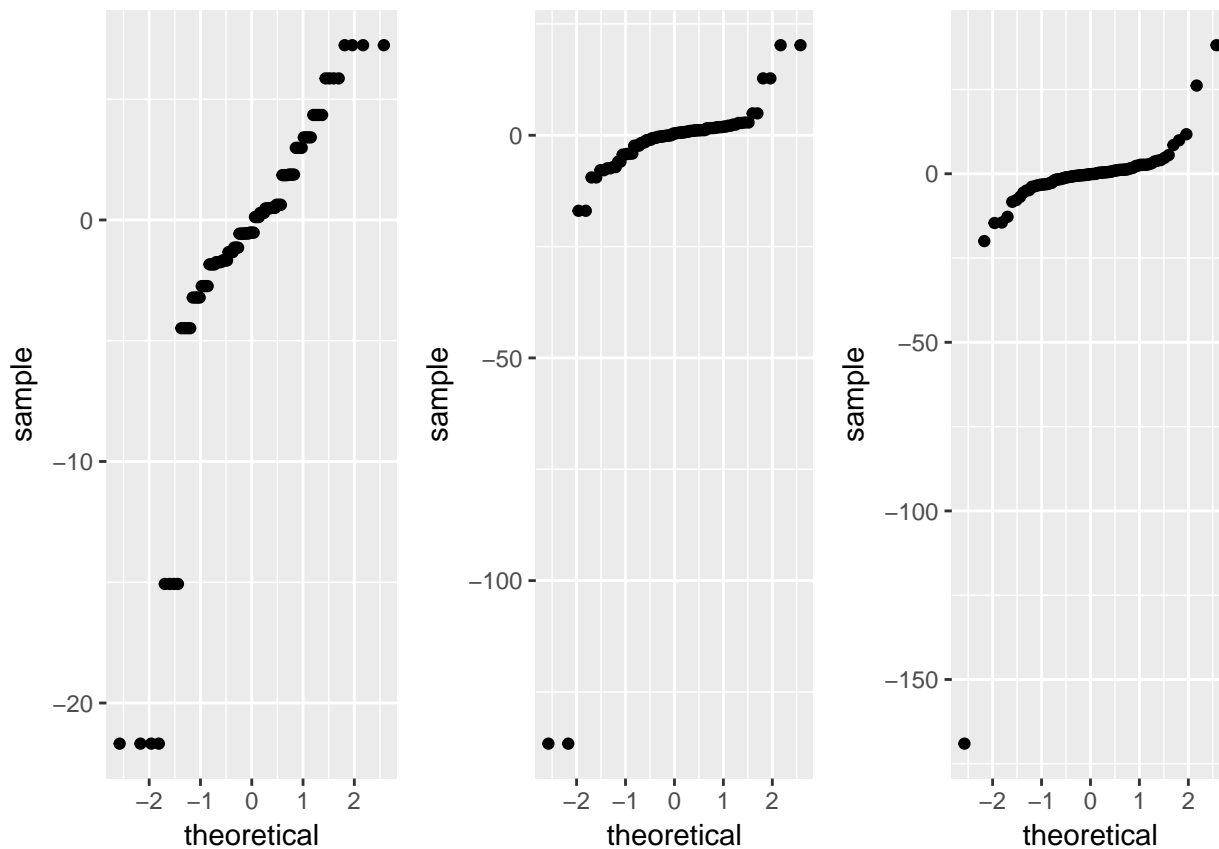
```
# runi -> random number from unif distr
Z <- data.frame(first = rnorm(25, mean = 0, sd = 1),
                 second = rnorm(50, mean = 0, sd = 1),
                 third = rnorm(100, mean = 0, sd = 1))

U <- data.frame(first = runif(25, 0, 1),
                 second = runif(50, 0, 1),
                 third = runif(100, 0, 1))

Y <- Z / U

# stat_qq and geom_qq build up sample and theoretical quantiles.
graph1 <- ggplot(Y) + geom_qq(aes(sample = first))
graph2 <- ggplot(Y) + geom_qq(aes(sample = second))
graph3 <- ggplot(Y) + geom_qq(aes(sample = third))

grid.arrange(graph1, graph2, graph3, ncol = 3) # multiplot works as well
```

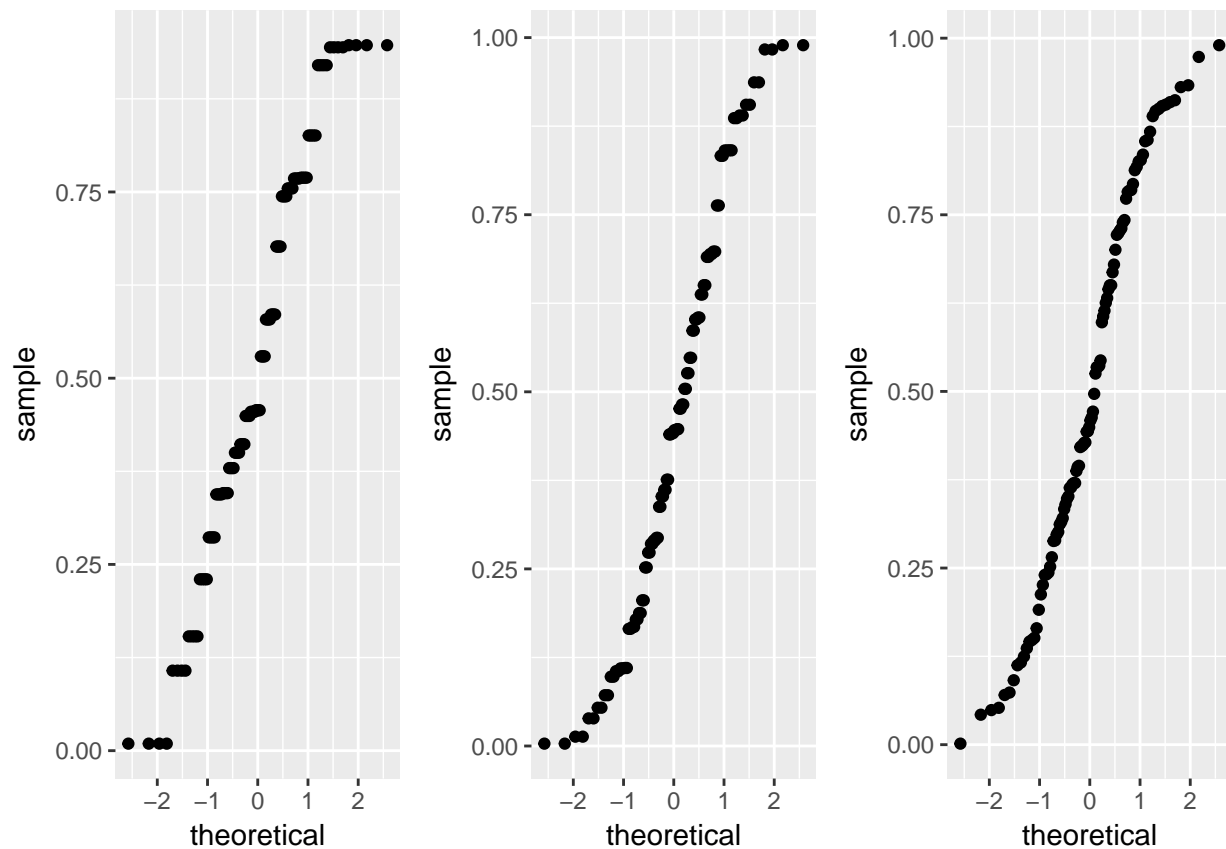


D)

```
generator4 <- data.frame(first = runif(25, 0, 1),
                          second = runif(50, 0, 1),
                          third = runif(100, 0, 1))

# stat_qq and geom_qq build up sample and theoretical quantiles.
graph1 <- ggplot(generator4) + geom_qq(aes(sample = first))
graph2 <- ggplot(generator4) + geom_qq(aes(sample = second))
graph3 <- ggplot(generator4) + geom_qq(aes(sample = third))

grid.arrange(graph1, graph2, graph3, ncol = 3) # multiplot works as well
```

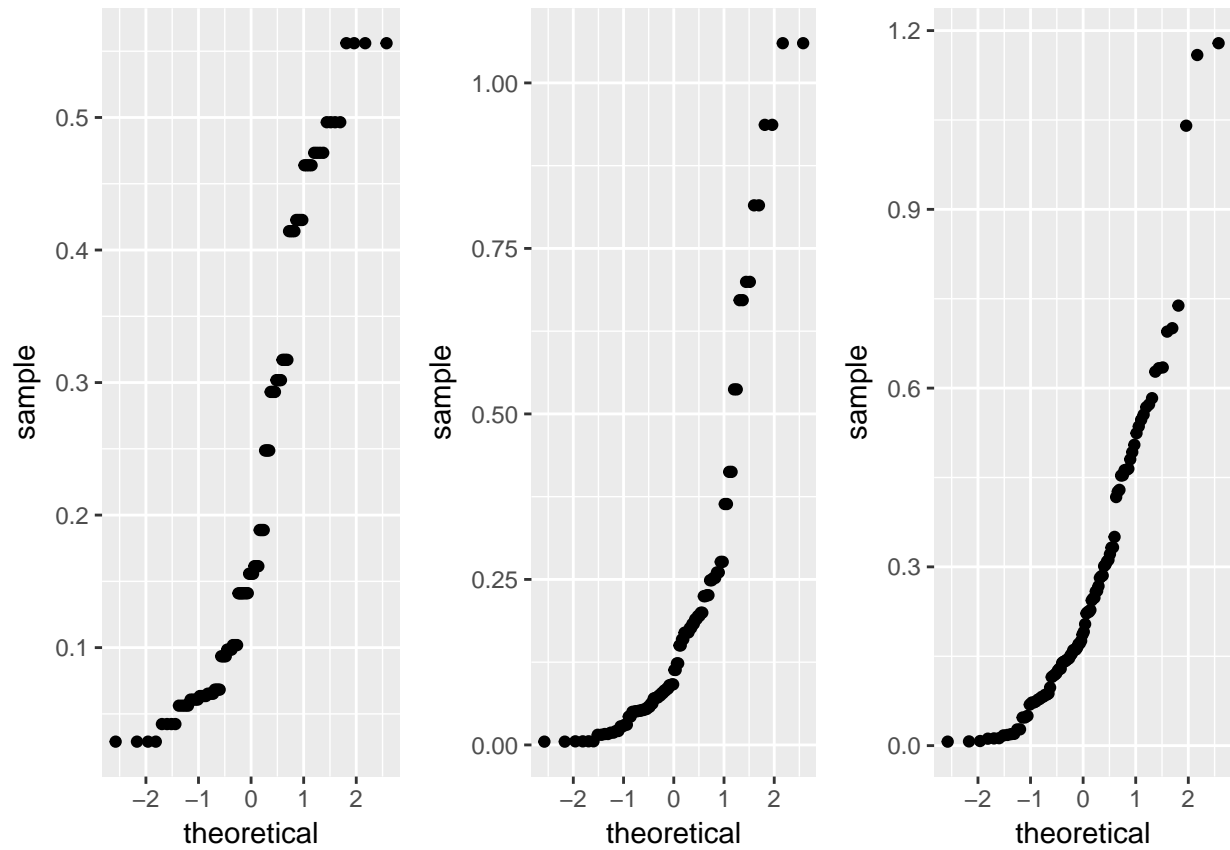


E)

```
# rexp -> random number from exponential distr
generator5 <- data.frame(first = rexp(25, 4),
                        second = rexp(50, 4),
                        third = rexp(100, 4))

# stat_qq and geom_qq build up sample and theoretical quantiles.
graph1 <- ggplot (generator5) + geom_qq(aes(sample = first))
graph2 <- ggplot (generator5) + geom_qq(aes(sample = second))
graph3 <- ggplot (generator5) + geom_qq(aes(sample = third))

grid.arrange(graph1, graph2, graph3, ncol = 3) # multiplot works as well
```



F) *Chi Square is right skewed. Positive value only!!!!*  
*Z/U is heavy – tailed!!!*  
*Uniform is light – tailed!!! From Zero to One!!!*  
*Exponential is right skewed. From Zero to One!!!*  
*The more plots, the graph looks more obvious!!!*