n<-3 #Let's look at the distribution of the sum of 3 independent uniform(0,1) r.v.'s. You can increase the value of n and see what happens when you run the code. As n increases, what would you expect the shape of the sum of the r.v.'s to look like?

```
sample.size<-n

nsim<-10000 #You can also increase this number. It represents the number of simulations.

s<-rep(0,nsim) #We initialize the vector of sums, and then start the loop.

for (i in 1:nsim) {

s[i]<-sum(runif(sample.size))

}

hist(s,freq=F) #create a histogram of the sum of n independent uniform(0,1) r.v.'s.
```

Now, input this R code and generate the sampling distribution of $\bar{Y}$ for sample size n = 10, 100, and 1000. Generate 10000 sample means. Then, maybe generate 100,000 sample means.

Let's start with $\theta = 5$

Using R-code

```
theta<-5 #You can change this value also if you like.

n<- 10 #then try changing this to 100, then 1000, and then 10000

sample.size<-n

nsim<-10000 #change this value as well and see what happens. It represents the number of simulations

ybar<-rep(0,nsim) #we are initializing the vector of sample means.

#Now we start a loop to get R to fill in the vector, ybar.

for (i in 1:nsim){

ybar[i]<-mean(rexp(sample.size,1/theta))

}

hist(ybar,freq=F) #plot the histogram of y-bar values. What shape do you expect this distribution to have for larger sample sizes (values of n).
```