**R Code for part (d)**

> #Problem 2.20, Part (d)

>

> f<-function(x, a=1){exp(-x)/(1-exp(-a))} #defining the truncated exponential function

> g<-function(x){dexp(x, rate=1)}

> set.seed(1)

> n=20000 #number of sample points to generate

> prop.func<-rexp(n) #generating exponentially distributed random variables

> U<-runif(n) #generating uniform random variables

> C<-1/(1-exp(-1)) #optimal C from part (b)

> U.a<- U < f(prop.func)/(C\*g(prop.func))

> accept<-prop.func[U.a] #accepted points

> proportion<-length(accept)/n #Proportion is 1 since the f and C\*g cancel out when a=1.

> x.accept<-sort(accept)

> x<-seq(-10,10, by=0.1)

> hist(x.accept, xlim=c(0, 10), prob=T, main = "Histogram with Trunc Exp Overlay")

> lines(x, f(x), col="blue")

>

> #The proportion of accepted points is 1 when a=1. This can also be seen in the histogram plot.

> #The true truncated exponential distribution function lies over the histogram, suggesting that

> #it has accepted all points. The theoretical proportion of accepted points is 0.632

> #(the efficiency). However, when this theoretical proportion is computed, it is being computed

> #for all values of a. Here, we are only considering a=1 and this value of a along with the

> #optimal value of C results in the proposal function\*C = truncated exponential function.

> #Hence, the proportion of 1.

