```
# Question 1 #

n <- 10000
u <- runif(n, 0, sqrt(2/pi))
v <- runif(n, -1, 1)
y <- v / u
accept <- (u^2 <= exp(-0.5 * y^2))
samples <- y[accept]
while (length(samples) < n) {
  u <- runif(n, 0, sqrt(2/pi))
  v <- runif(n, -1, 1)
  y <- v / u
  accept <- (u^2 <= exp(-0.5 * y^2))
  samples <- c(samples, y[accept])
  samples <- samples[1:n]
}

# Question 2 #

n <- 10000

x1 <- runif(n, 0, 1)
mc_integral1 <- mean(exp(x1)) * 1

x2 <- runif(n, 0, pi)
mc_integral2 <- mean(sqrt(x2^3) + sqrt(x2) - (x2^2) * sin(4 * x2)) * pi

mc_integral1
mc_integral2
```