**Question 1.** My aim is to generate 10000 data points that follows the following distribution with PDF: *f*(*x*) = 2*xe^(-x^2,)* *x >* 0. Please use inverse transformation method to generate the data, make a histogram and compare with the example function of pdf. You need provide both derivation, R code and output

Question 2. My aim is to generate 10000 data points that follows the following distributionwith PDF: f(x) = 60x^3(1 - x)^2, 0 ≤ x ≤ 1. Please use Acceptance-Rejection method to generate the data, make a histogram and compare with the original pdf f(x). You need provideboth derivation, R code and output.

Question 3

Let θ = , now answer the following question (you need provide details, including R code)

(a) Estimate θ using the Monte Carlo method (any pdf you preferred), and also find the estimated standard error. Use n = 10000.

(b) Estimate θ using importance sampling method, that is, select a new pdf function: X ∼ N(1:5; 1). Also, find the standard error. Compared with (a), which option is better? (Hint: you can use rnorm(n,1.5,1)) to sample data)