**R Group Assignment**

**1 SSCM**

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**Q 1 (A):**

> a=function(x)

+ {

+ y=sqrt(4-x^2)

+ }

> a=function(x)

+ {

+ y=sqrt(4-x^2)

+ y

+ }

> integrate(a,-2,2)

6.283185 with absolute error < 4e-09

**Q 1(B):**

> b=function (x)

+ {

+ y=1/(3+5\*sin (x))

+ y

+ }

> integrate(b,pi/2,0)

-0.2746531 with absolute error < 6.5e-13

**Q 2(A):**

> m=expression(x^2)

> D(m,"x")

2 \* x

**Q 2(B):**

> n=expression(exp^(-x)/sinh(2\*x))

> D(n,"x")

-(exp^(-x) \* log(exp)/sinh(2 \* x) + exp^(-x) \* (cosh(2 \* x) \*

2)/sinh(2 \* x)^2)

**Q 3:**

First, we should change directory the folder where we save the data. Rename the “babies” to **“babies.txt”**

Then, type the command below to read the data;

> babies<-read.table("babies.txt",header=T,as.is=T)

To get the first 5 column, type as command below;

> babies[1:5,]

id pluralty outcome date gestation sex wt parity race age ed ht wt1 drace

1 15 5 1 1411 284 1 120 1 8 27 5 62 100 8

2 20 5 1 1499 282 1 113 2 0 33 5 64 135 0

3 58 5 1 1576 279 1 128 1 0 28 2 64 115 5

4 61 5 1 1504 999 1 123 2 0 36 5 69 190 3

5 72 5 1 1425 282 1 108 1 0 23 5 67 125 0

dage ded dht dwt marital inc smoke time number

1 31 5 65 110 1 1 0 0 0

2 38 5 70 148 1 4 0 0 0

3 32 1 99 999 1 2 1 1 1

4 43 4 68 197 1 8 3 5 5

5 24 5 99 999 1 1 1 1 5

**4)**

**Random Numbers**

> x<-rnorm(100,0,1)

> x

[1] 0.40434434 -0.43597978 1.79053856 -0.38740548 -0.12021304 -0.70241349

[7] 1.09829758 1.15536759 -0.01551067 -2.88322676 1.46124481 0.28877225

[13] 0.49680846 1.52166161 0.21667249 -0.74941823 1.08203367 -0.90213171

[19] 0.13354573 -0.20815372 -0.77354238 -0.54705325 0.67034898 0.08789473

[25] 1.16178117 -1.08811453 0.26035835 -1.33078818 -1.07877263 0.29195720

[31] 1.48364614 0.04789408 -2.21306738 0.46366674 -0.11276257 0.81375514

[37] 1.82364922 2.17524360 1.20562332 0.27361394 0.47917428 -1.01934450

[43] 2.48363741 1.26799988 2.14831459 0.49828511 1.36995245 -0.16634552

[49] 0.33126072 -0.99315991 1.14825855 -0.05145182 -0.19324515 0.95321154

[55] 1.04837295 -0.76078089 0.60299290 0.19037663 -0.04574046 0.89448050

[61] 1.41711215 -0.19263519 -0.62228206 -1.86917085 0.88384625 0.35487797

[67] -0.49136764 -1.19844486 2.04564166 0.22805177 -1.19870086 0.51738703

[73] 0.96528537 2.23324446 1.30302887 0.84498323 1.40353681 0.13959522

[79] 0.46927755 0.78330123 1.37667048 0.81311426 -1.39556239 -0.40523752

[85] 1.14702848 1.41130255 -0.81160926 1.20457492 0.12768172 -0.46215220

[91] -0.24514584 1.01008398 -0.69648933 -0.87505872 -0.60439626 0.90332575

[97] 1.38834561 -0.96968316 0.58333382 -0.48139808

> mean(x)

[1] 0.2808171

> sd(x)

[1] 1.025457

**5.**

rgamma(100,shape=1,scale=0.5)

[1] 0.744155362 0.126664805 0.084521859 0.098932838 0.481056905 1.647740844

[7] 1.283027131 0.164024754 0.570952237 0.189363947 0.081978995 0.046576152

[13] 0.459245716 0.241009614 0.163360222 0.513729951 0.171506568 0.281732641

[19] 0.154024103 1.274998383 0.009556644 0.698618964 0.455827557 0.403108755

[25] 0.802436318 0.368765577 0.249982709 0.649854871 0.295204069 0.656819051

[31] 0.207965373 0.603750981 0.078472829 0.862933980 0.579853601 0.323998906

[37] 1.373736222 0.116840854 0.718701552 0.100797186 0.274648770 0.056791725

[43] 1.594165484 0.398910052 0.572109707 0.227303808 0.096935404 0.854657881

[49] 0.195472696 0.010105089 2.466921626 0.665625413 2.245400719 0.595313486

[55] 0.710186948 0.237108827 0.030395541 0.431225378 0.860484588 0.095499736

[61] 0.115209949 0.243131580 0.496942750 0.371875493 0.021526150 0.083946501

[67] 0.861237046 0.425312306 0.153459993 0.110876208 0.356700544 0.523426952

[73] 0.620379204 0.095900358 0.331516172 0.370506118 0.028290348 0.990977165

[79] 0.785328081 0.144260643 0.155784350 0.263165303 0.230471015 1.549512474

[85] 0.924489801 0.811600005 0.341368453 0.371340510 0.739331837 0.564988915

[91] 0.186764897 1.037969077 0.213177514 0.673680861 0.358301934 0.368401519

[97] 0.129876407 0.652906470 0.131422352 0.153238301

> hist(rgamma(100,shape=1,scale=0.5))



**6. a**)

> R = matrix(c(3,1,-4,2),ncol=2)

> R

[,1] [,2]

[1,] 3 -4

[2,] 1 2

**b)**

> t(R)

[,1] [,2]

[1,] 3 1

[2,] -4 2

**c)**

> solve(R)

[,1] [,2]

[1,] 0.2 0.4

[2,] -0.1 0.3

> b= matrix(c(6,-3),ncol=1)

> b

[,1]

[1,] 6

[2,] -3

> solve(R)%\*%b

[,1]

[1,] -2.775558e-16

[2,] -1.500000e+00