ASSIGNMENT-5

Question-1).

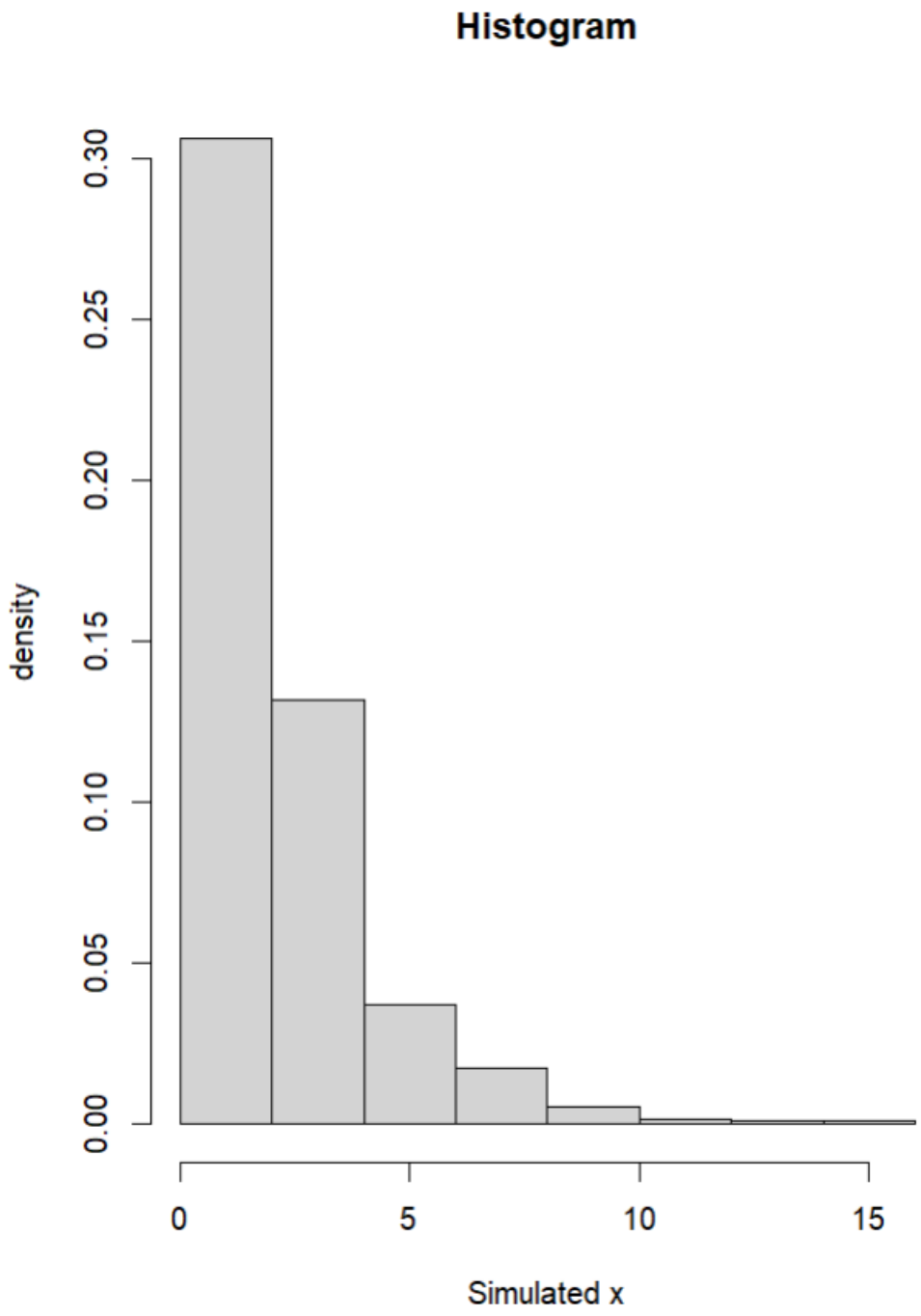
```
q1a<-punif(45,0,60,lower.tail = FALSE)
q1b<-punif(30,0,60)-punif(20,0,60)
print(q1a)
print(q1b)
```

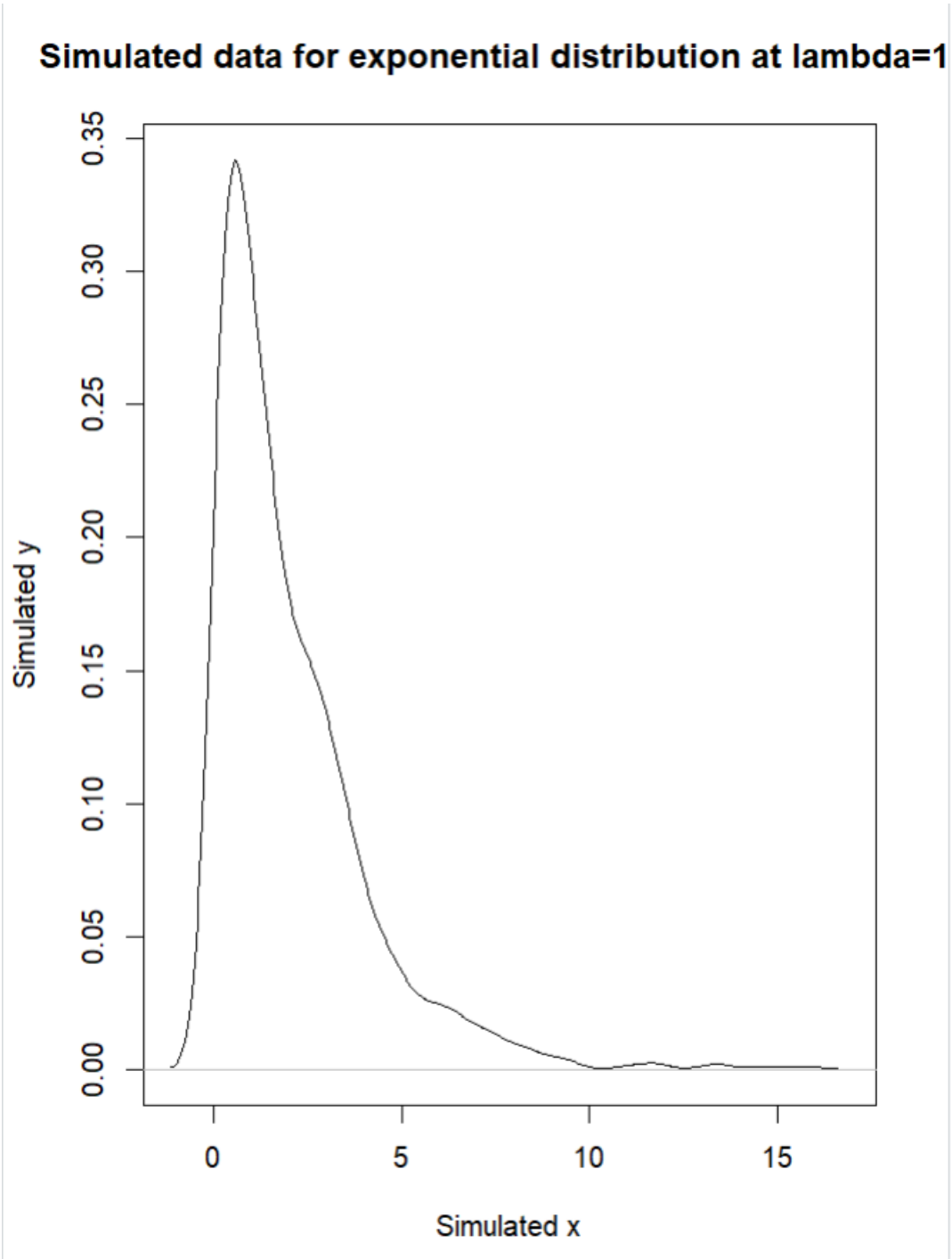
```
> q1a<-punif(45,0,60,lower.tail = FALSE)
> q1b<-punif(30,0,60)-punif(20,0,60)
> print(q1a)
[1] 0.25
> print(q1b)
[1] 0.1666667
>
```

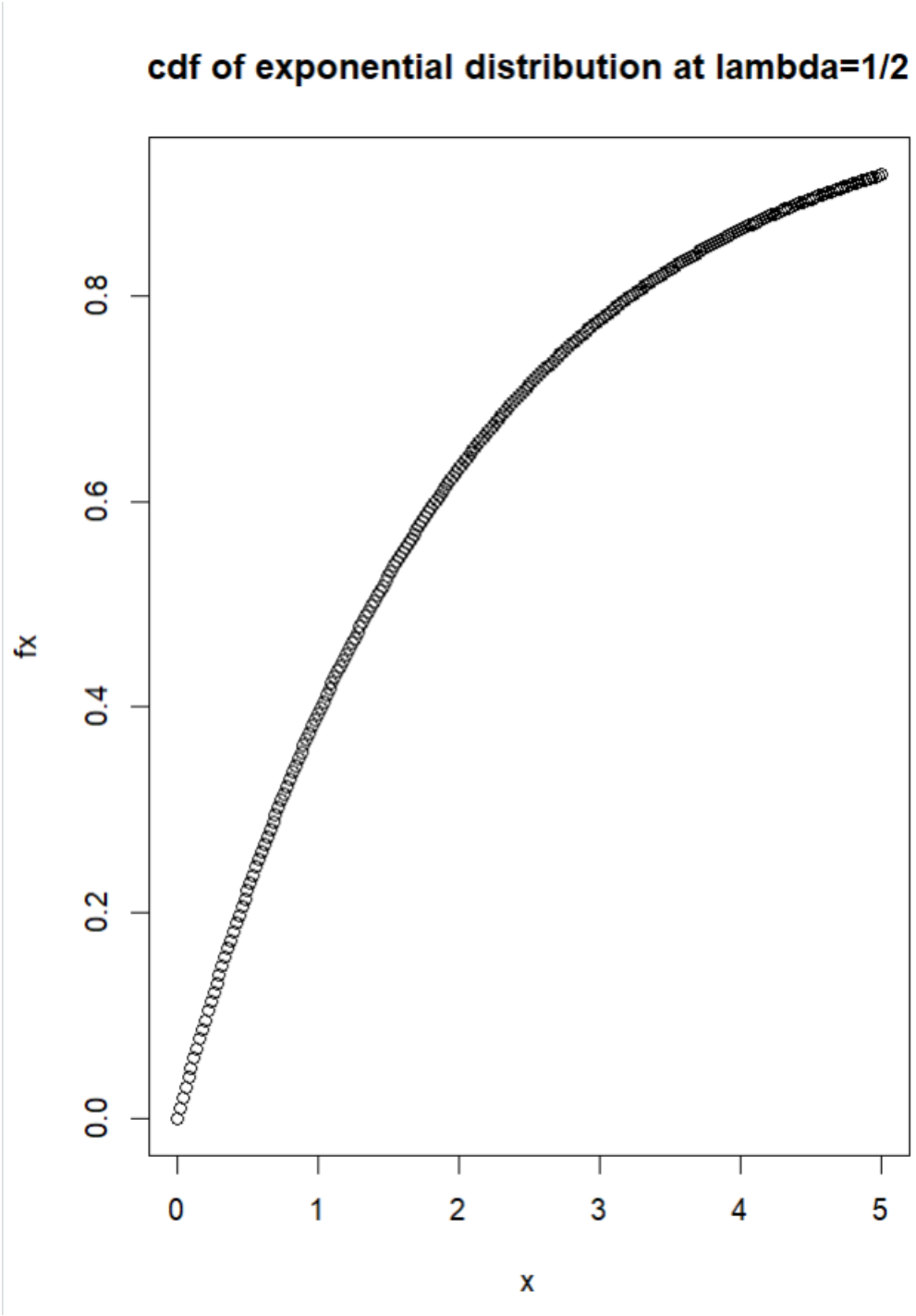
Question-2).

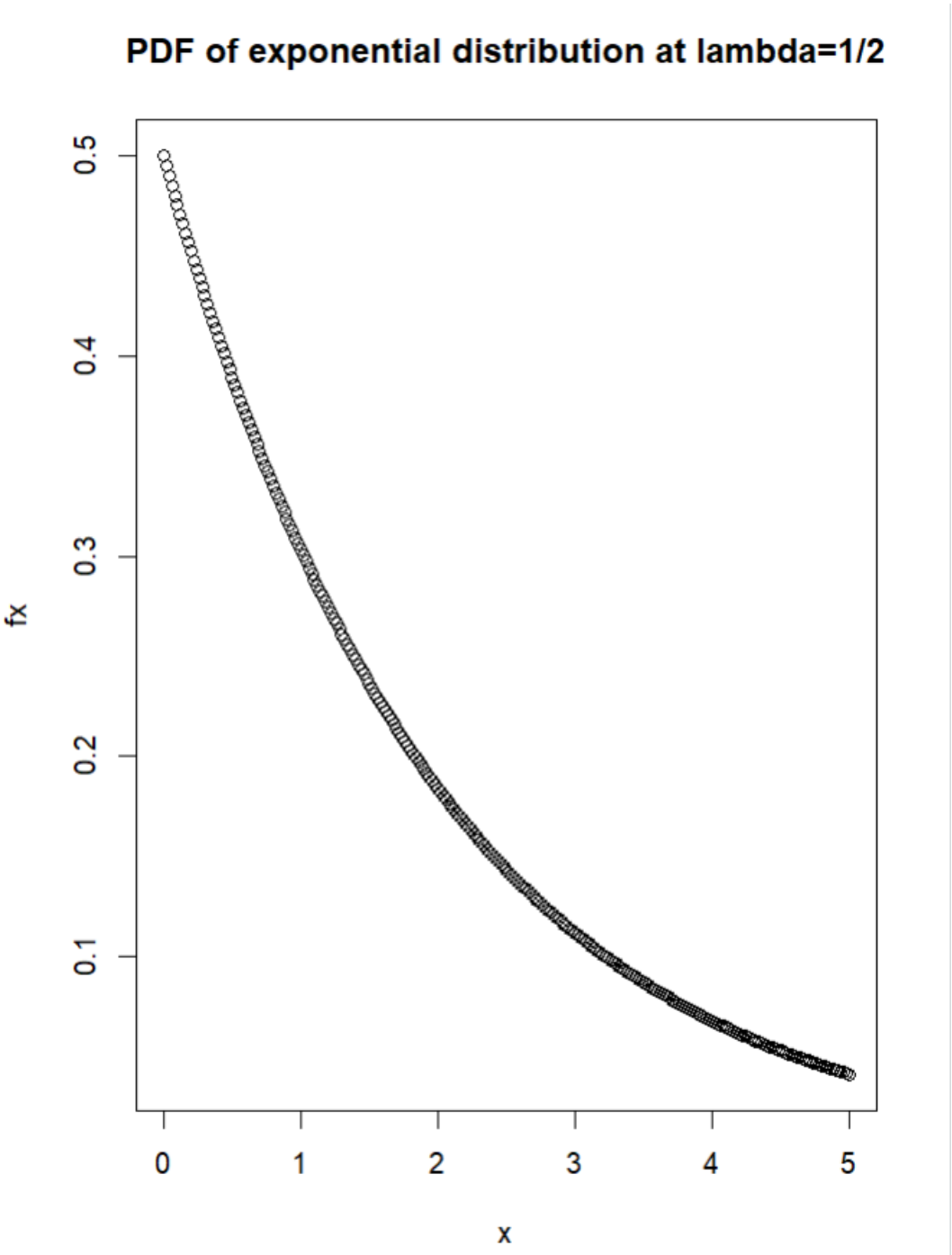
```
# Q2
# (a)
a1 <- dexp(3, rate=1/2)
a1

# (b)
x <- seq(0, 5, by=0.02)
fx <- dexp(x, rate=1/2)
plot(x, fx, xlab="x", ylab="fx", main="PDF of exponential distribution at lambda=1/2")

# (c)
a2 <- pexp(3, rate=1/2)
a2

# (d)
x <- seq(0, 5, by=0.02)
fx <- pexp(x, rate=1/2)
plot(x, fx, xlab="x", ylab="fx", main="cdf of exponential distribution at lambda=1/2")

# (e)
n <- 1000
x_sim <- rexp(n, rate=1/2)
plot(density(x_sim), xlab="Simulated x", ylab="Simulated y", main="Simulated data for exponential distribution at lambda=1/2")

hist(x_sim, probability = TRUE, xlab="Simulated x", ylab="density", main="Histogram")
```

```
> # Q2
> # (a)
> a1 <- dexp(3, rate=1/2)
> a1
[1] 0.1115651
>
> # (b)
> x <- seq(0, 5, by=0.02)
> fx <- dexp(x, rate=1/2)
> plot(x, fx, xlab="x", ylab="fx", main="PDF of exponential distribution at lambda=1/2")
>
> # (c)
> a2 <- pexp(3, rate=1/2)
> a2
[1] 0.7768698
>
> # (d)
> x <- seq(0, 5, by=0.02)
> fx <- pexp(x, rate=1/2)
> plot(x, fx, xlab="x", ylab="fx", main="cdf of exponential distribution at lambda=1/2")
>
> # (e)
> n <- 1000
> x_sim <- rexp(n, rate=1/2)
> plot(density(x_sim), xlab="Simulated x", ylab="Simulated y", main="Simulated data for exponential distribution at lambda=1/2")
>
> hist(x_sim, probability = TRUE, xlab="Simulated x", ylab="density", main="Histogram")
>
```


Histogram
density
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0
5
10
15
Simulated x


Simulated data for exponential distribution at lambda=1
Simulated y
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0
5
10
15
Simulated x


cdf of exponential distribution at lambda=1/2
fx
0.0
0.2
0.4
0.6
0.8
0
1
2
3
4
5
x


PDF of exponential distribution at lambda=1/2
fx
0.1
0.2
0.3
0.4
0.5
0
1
2
3
4
5
x

Question-3).

```r
# Q3
alpha <- 2
beta <- 1/3

# (a)
pgamma(x, shape=alpha, scale=beta)
a1 <- pgamma(1, shape=alpha, scale=beta, lower.tail=FALSE)
a1

# (b)
a2 <- qgamma(0.70, shape=alpha, scale=beta)
a2
```

```
> # Q3
> alpha <- 2
> beta <- 1/3
>
> # (a)
> pgamma(x, shape=alpha, scale=beta)
  [1] 0.000000000 0.001729594 0.006649111 0.014381151 0.024581452 0.036936313 0.051160197 0.066993516 0.084200580
 [10] 0.102567691 0.121901382 0.142026785 0.162786120 0.184037300 0.205652637 0.227517646 0.249529943 0.271598221
 [19] 0.293641307 0.315587293 0.337372734 0.358941900 0.380246099 0.401243044 0.421896269 0.442174600 0.462051658
 [28] 0.481505408 0.500517744 0.519074102 0.537163113 0.554776277 0.571907671 0.588553673 0.604712719 0.620385072
 [37] 0.635572618 0.650278670 0.664507802 0.678265688 0.691558959 0.704395070 0.716782184 0.728729066 0.740244979
 [46] 0.751339603 0.762022951 0.772305299 0.782197120 0.791709029 0.800851727 0.809635957 0.818072466 0.826171962
 [55] 0.833945085 0.841402380 0.848554271 0.855411038 0.861982799 0.868279495 0.874310877 0.880086491 0.885615672
 [64] 0.890907535 0.895970969 0.900814634 0.905446953 0.909876116 0.914110074 0.918156543 0.922023001 0.925716689
 [73] 0.929244620 0.932613571 0.935830094 0.938900519 0.941830952 0.944627286 0.947295201 0.949840171 0.952267467
 [82] 0.954582164 0.956789145 0.958893106 0.960898560 0.962809846 0.964631130 0.966366413 0.968019535 0.969594180
 [91] 0.971093882 0.972522030 0.973881871 0.975176519 0.976408954 0.977582031 0.978698486 0.979760933 0.980771877
[100] 0.981733714 0.982648735 0.983519130 0.984346994 0.985134328 0.985883046 0.986594975 0.987271861 0.987915371
[109] 0.988527096 0.989108557 0.989661203 0.990186419 0.990685525 0.991159781 0.991610389 0.992038495 0.992445191
[118] 0.992831520 0.993198473 0.993546998 0.993877996 0.994192328 0.994490810 0.994774225 0.995043313 0.995298783
[127] 0.995541308 0.995771529 0.995990058 0.996197474 0.996394332 0.996581157 0.996758451 0.996926690 0.997086327
[136] 0.997237794 0.997381500 0.997517837 0.997647175 0.997769866 0.997886247 0.997996636 0.998101337 0.998200637
[145] 0.998294810 0.998384118 0.998468806 0.998549111 0.998625256 0.998697452 0.998765902 0.998830797 0.998892319
[154] 0.998950640 0.999005925 0.999058330 0.999108003 0.999155084 0.999199706 0.999241996 0.999282075 0.999320057
[163] 0.999356050 0.999390156 0.999422474 0.999453096 0.999482110 0.999509600 0.999535644 0.999560318 0.999583692
[172] 0.999605836 0.999626812 0.999646682 0.999665503 0.999683331 0.999700216 0.999716209 0.999731356 0.999745701
[181] 0.999759286 0.999772151 0.999784335 0.999795872 0.999806796 0.999817141 0.999826936 0.999836210 0.999844991
[190] 0.999853305 0.999861176 0.999868628 0.999875683 0.999882361 0.999888684 0.999894668 0.999900334 0.999905697
[199] 0.999910773 0.999915578 0.999920125 0.999924430 0.999928504 0.999932359 0.999936008 0.999939462 0.999942730
[208] 0.999945823 0.999948750 0.999951520 0.999954141 0.999956621 0.999958967 0.999961188 0.999963289 0.999965277
[217] 0.999967158 0.999968938 0.999970621 0.999972214 0.999973721 0.999975147 0.999976496 0.999977772 0.999978979
[226] 0.999980121 0.999981201 0.999982223 0.999983190 0.999984104 0.999984969 0.999985787 0.999986560 0.999987292
[235] 0.999987984 0.999988639 0.999989258 0.999989843 0.999990397 0.999990921 0.999991416 0.999991885 0.999992328
[244] 0.999992746 0.999993143 0.999993517 0.999993871 0.999994206 0.999994523 0.999994822 0.999995106
> a1 <- pgamma(1, shape=alpha, scale=beta, lower.tail=FALSE)
> a1
[1] 0.1991483
>
> # (b)
> a2 <- qgamma(0.70, shape=alpha, scale=beta)
> a2
[1] 0.8130722
>
```