第一次作业

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1 第一题

1. 随机变量 X $B(10, 0.4)$, 求分布律和分布函数，求 $P(X = 3)$ 解：

```
x<-0:20
(y<-dbinom(x,10,0.4))# 分布律
```

```
##  [1] 0.0060466176 0.0403107840 0.1209323520 0.2149908480 0.2508226560
##  [6] 0.2006581248 0.1114767360 0.0424673280 0.0106168320 0.0015728640
## [11] 0.0001048576 0.0000000000 0.0000000000 0.0000000000 0.0000000000
```

```
## [16] 0.0000000000 0.0000000000 0.0000000000 0.0000000000 0.0000000000
## [21] 0.0000000000
```

```
(pbinom(x,10,0.4))# 分布函数
```

```
##  [1] 0.006046618 0.046357402 0.167289754 0.382280602 0.633103258 0.833761382
##  [7] 0.945238118 0.987705446 0.998322278 0.999895142 1.000000000 1.000000000
## [13] 1.000000000 1.000000000 1.000000000 1.000000000 1.000000000 1.000000000
## [19] 1.000000000 1.000000000 1.000000000
```

求 $P(X=3)$

```
(pbinom(3,10,0.4))
```

```
## [1] 0.3822806
```

2 第二题

随机变量 X 服从 1 到 5 的离散均匀分布，求 $P(1<X<3)$

```
(punif(3,1,5)-punif(1,1,5))
```

```
## [1] 0.5
```

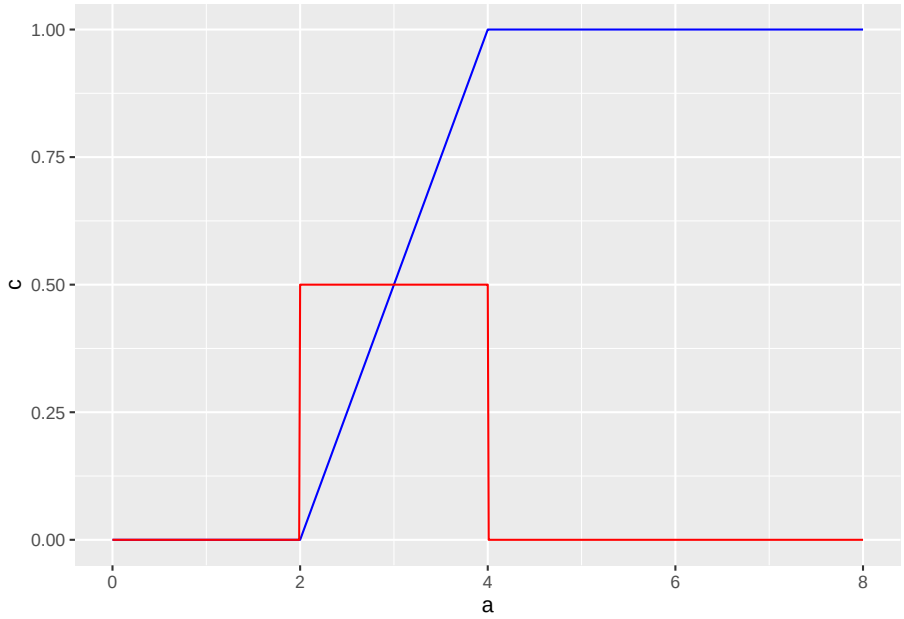
3 第三题

随机变量 X $U(2,4)$, 画出密度函数和分布函数，求 $P(2.5<X<3.5)$

```
x<-seq(0,8,0.01)
y<-dunif(x,2,4)
z<-punif(x,2,4)
data1<-data.frame(a=x,b=y,c=z)
#g<-ggplot(data = data1,aes(x=a,y=b),col="red")+geom_line()
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.0.2
```

```
ggplot()+geom_line(data=data1,aes(x=a,y=c),col="blue")+geom_line(data = data1,aes(x=a,y
```



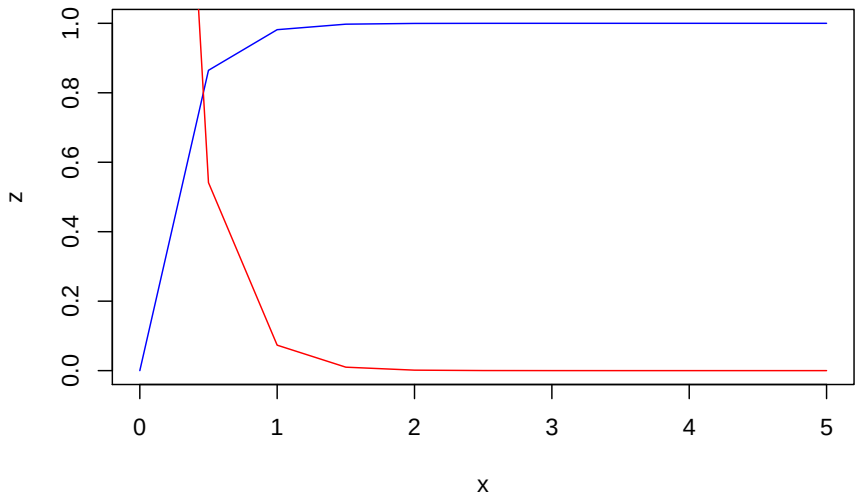

```
(punif(3.5,2,4)-punif(2.5,2,4))
```

```
## [1] 0.5
```

4 第四题

随机变量 X $E(4)$ 画出密度函数和分布函数，求 $P(1<X<5)$

```
x<-seq(0,5,0.5)
y<-dexp(x,4)
z<-pexp(x,4)
plot(x,z,type = "l",col="blue")
lines(x,y,type ="l",col="red")
```

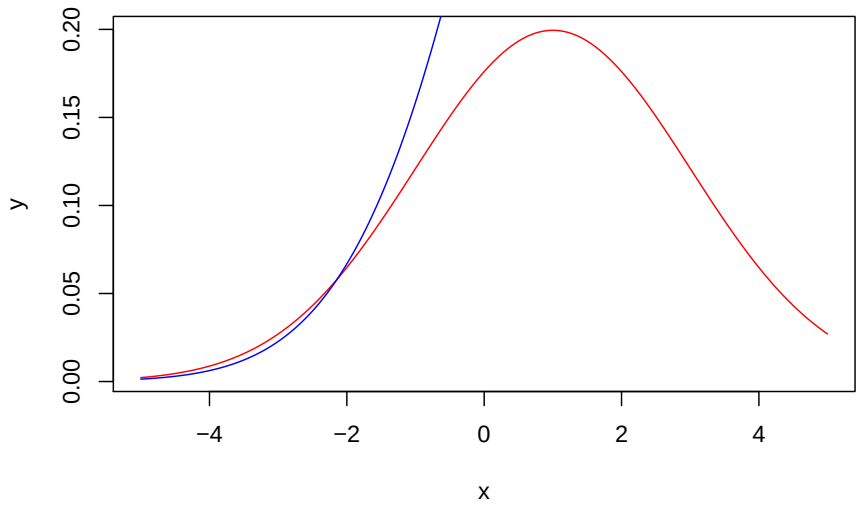



```
(pexp(5,4)-pexp(1,4))
```

```
## [1] 0.01831564
```

5 第五题

```
x<-seq(-5,5,0.01)
y<-dnorm(x,1,2)
z<-pnorm(x,1,2)
plot(x,y,type = "l",col="red")
lines(x,z,type="l",col="blue")
```




```
(pnorm(3,1,2)-pnorm(-2,1,2))
```

```
## [1] 0.7745375
```