Homework 1

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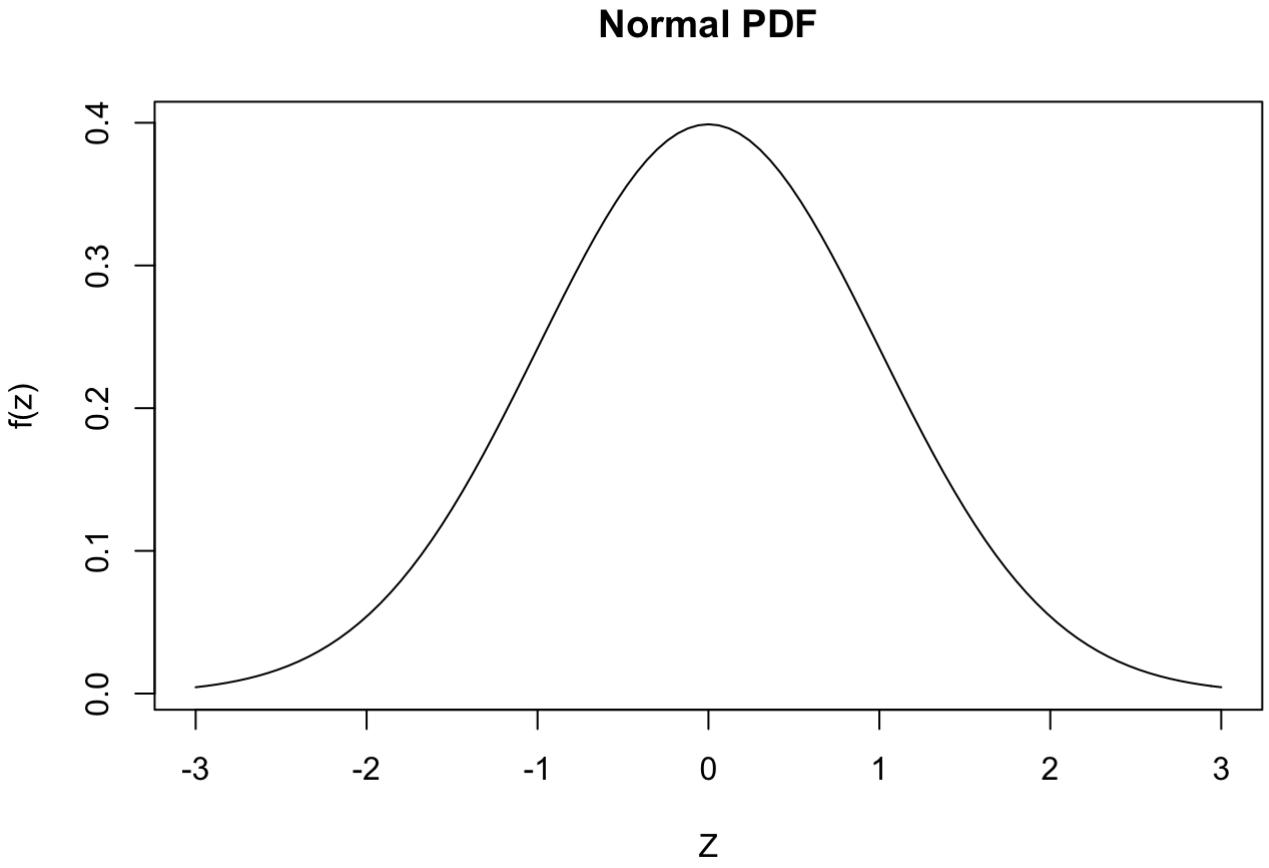
2

```
#2
curve(dnorm(x,mean=0,sd=1), from=-3, to = 3,
    ylab="f(z)", xlab="Z", main="Normal PDF")
```



3

```
#3
z_cdf = 2
pnorm(z_cdf)
```

```
## [1] 0.9772499
```

4

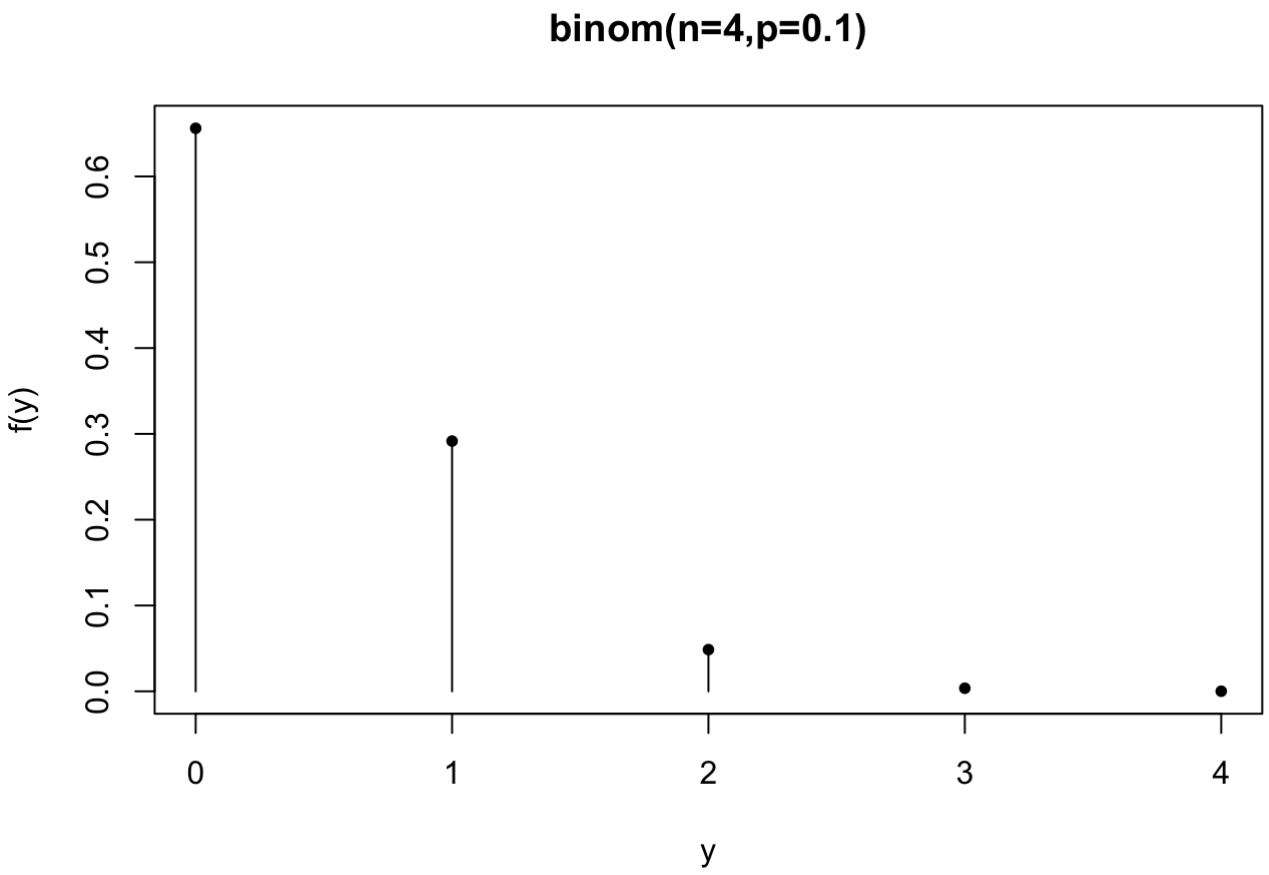
```
#4
qnorm(0.975)
```

```
## [1] 1.959964
```

5

```
#5
n = 4
plot(0:n, binprobs<- dbinom(0:n, size=n, p=0.1),
     ylab="f(y)", xlab="y",
     pch=20, main="binom(n=4,p=0.1)")

segments(0:n,rep(0,n),0:n, binprobs)
```



6

```
#6
pbinom(0, size = n, prob = 0.1, lower.tail = FALSE)
```

```
## [1] 0.3439
```

7

```
#7
pbinom(0.5, size = n, prob = 0.1, lower.tail = FALSE)
```

```
## [1] 0.3439
```

8

a. The mean of 1 + 2Y1 + 3Y2 is:

$$E(1 + 2Y_1 + 3Y_2) = 1 + 2\mu_1 + 3\mu_2$$

b. The covariance between Y1 and Y2 is:

$$Cov(Y_1, Y_2) = 0$$

c. The variance of the above linear combination is:

$$Var(1 + 2Y_1 + 3Y_2) = 1 + 2^2\sigma_1^2 + 3^2\sigma_2^2$$

d. The distribution of the above linear combination is a Normal Distribution i.e.

$$N(1 + 2\mu_1 + 3\mu_2, 1 + 2^2\sigma_1^2 + 3^2\sigma_2^2)$$