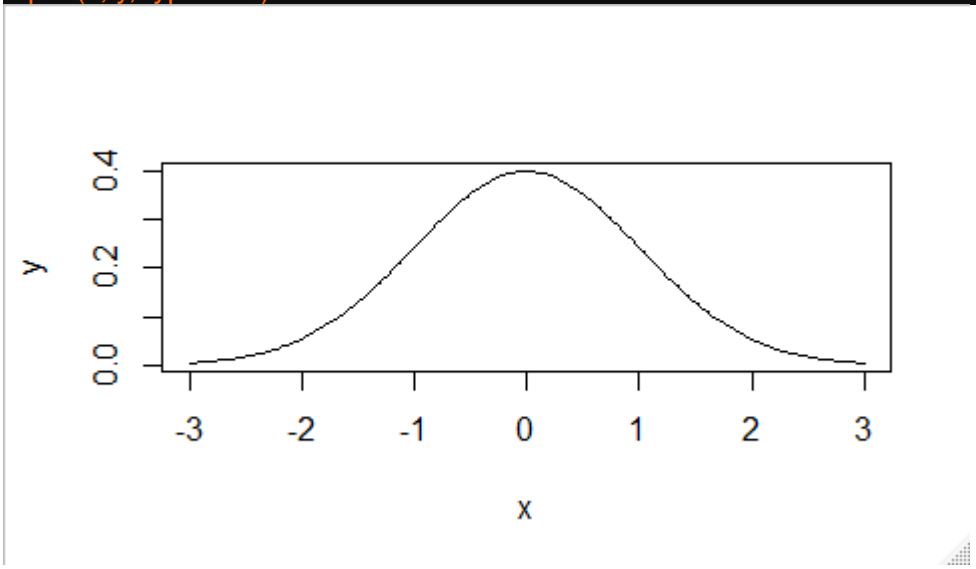
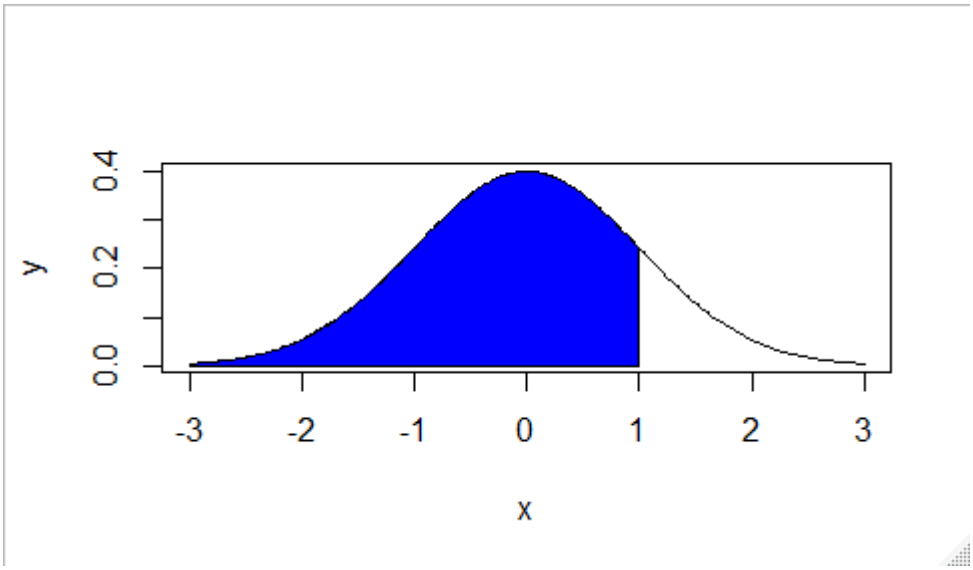
AUC

```
> x  =seq(-3, 3, length=200)
> y = dnorm(x, mean = 0, sd=1)
> plot(x, y, type = "l")
```



Problem : find the area to the left of 1

```
> x  =seq(-3, 1, length=200)
> y = dnorm(x, mean = 0, sd=1)
> polygon(c(-3, x, 1), c(0, y, 0), col = "blue")
> pnorm(0, mean = 0, sd=1)
> pnorm(1, mean = 0, sd=1)
[1] 0.8413447
```



Problem : find the area to the right of 1

```
> x  =seq(1, 3, length=200)
> y = dnorm(x, mean = 0, sd=1)
> polygon(c(1, x, 3), c(0, y, 0), col = "blue")
```

```
> pnorm(3, mean = 0, sd=1) - pnorm(1, mean = 0, sd=1)
[1] 0.1573054
```

Problem : find the P(30<X<70) with mean=50 and sd=10

```
> x = seq(30, 70, length=100)
> y = dnorm(x, mean = 50, sd=10)
> polygon(c(30, x, -0.2533), c(0, y, 0), col = "blue")
> qnorm(0.40, mean = 0, sd=1)
```

Qnorm :

```
> x=seq(-3, 3, length=10)
> prob = dnorm(x, mean = 0, sd=1)
> qnorm(prob, mean = 0, sd=1)
 [1] -2.6172670 -1.9394729 -1.2845366 -0.6999774 -0.3123606 -0.3123606 -0.6999774
-1.2845366
 [9] -1.9394729 -2.6172670
```

Large samples

Problem : The mean breaking strength of the cables supplied by a manufacturer is 1800 with a sd=100.By a new technique in the manufacturing process, it is claimed that the breaking strength of the cable has increased. To test this claim, a sample of 50 cables is tested and found that the mean breaking strength s 1850. Can we support the claim of 5% LOS?

```
> xbar=1850
> mu=1800
> sigma=100
> n=50
> z = abs(xbar-mu)/(sigma/sqrt(n))
> z

> alpha = 0.05
> zalpha = qnorm(1-alpha)
> zalpha

> if(z<zalpha){print("Accept H0")}else{print("Reject H0")}
```

Problem : Suppose the mean weight of king penguins found in an artic last year was 15.4kg. In a sample of 35 penguins same time this year in the same colony, the mean penguin weight was 14.6kg. Assume the population sd=2.5kg. At 0.05 significance level reject the null hypothesis that the mean penguin weight does not differ from last year.

```
> xbar=14.6
> mu=15.4
> sigma=2.5
> n=35
> z = abs(xbar-mu)/(sigma/sqrt(n))
> z
[1] 1.893146
> alpha = 0.05
> zalpha = qnorm(1-alpha/2)
> zalpha
[1] 1.959964
> if(z<=zalpha){print("Accept H0")}else{print("Reject H0")}
```

```
[1] "Accept H0"
```