# Normal Distribution Likelihood
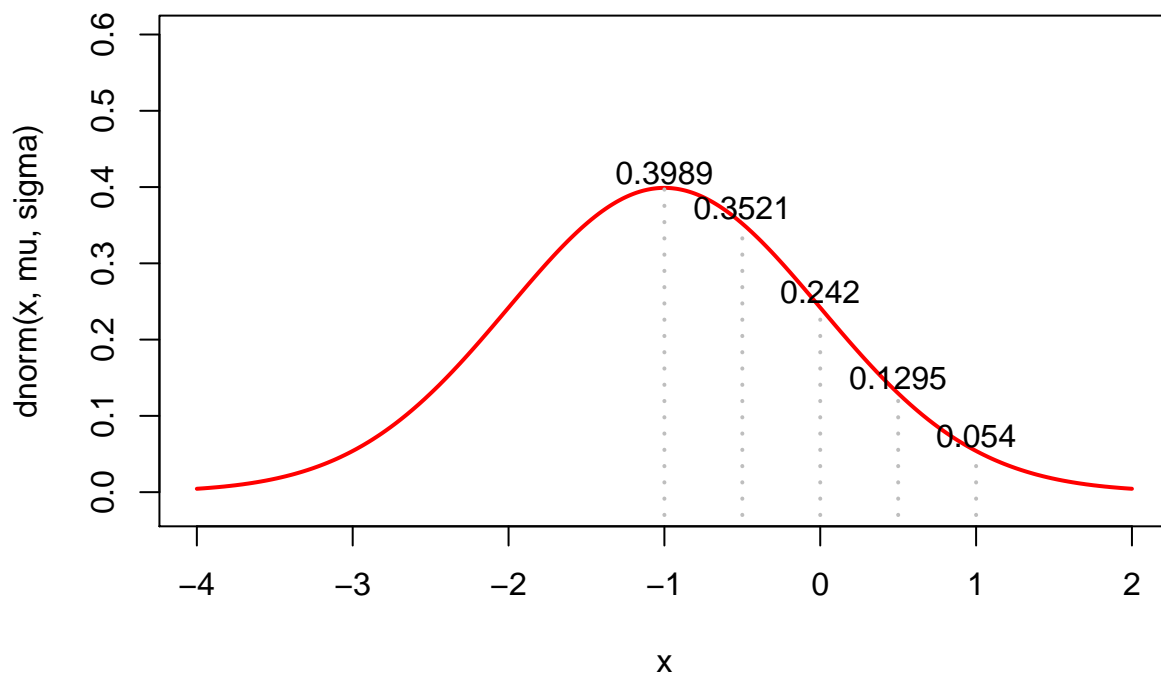
Finding best likelihood for c(-1, -.5, 0, .5, 1)

Assuming they are normal distribution.

**1st : likelihood of N(-1, 1)**

```r
mu = -1; sigma = 1
x = seq(mu-3, mu+3, 0.01)
plot(x, dnorm(x, mu, sigma), type='l', lwd=2, col='red', ylim=c(-0.02, 0.6))
xp = seq(-1, 1, length=5)
yp = dnorm(xp, mu, sigma)
for(i in seq(1, 5, 1)){
  segments(xp[i], -0.03, xp[i], yp[i], col = 'gray', lty=3, lwd=2)
  text(xp[i], yp[i]+0.02, labels=round(yp[i], 4))
}
```
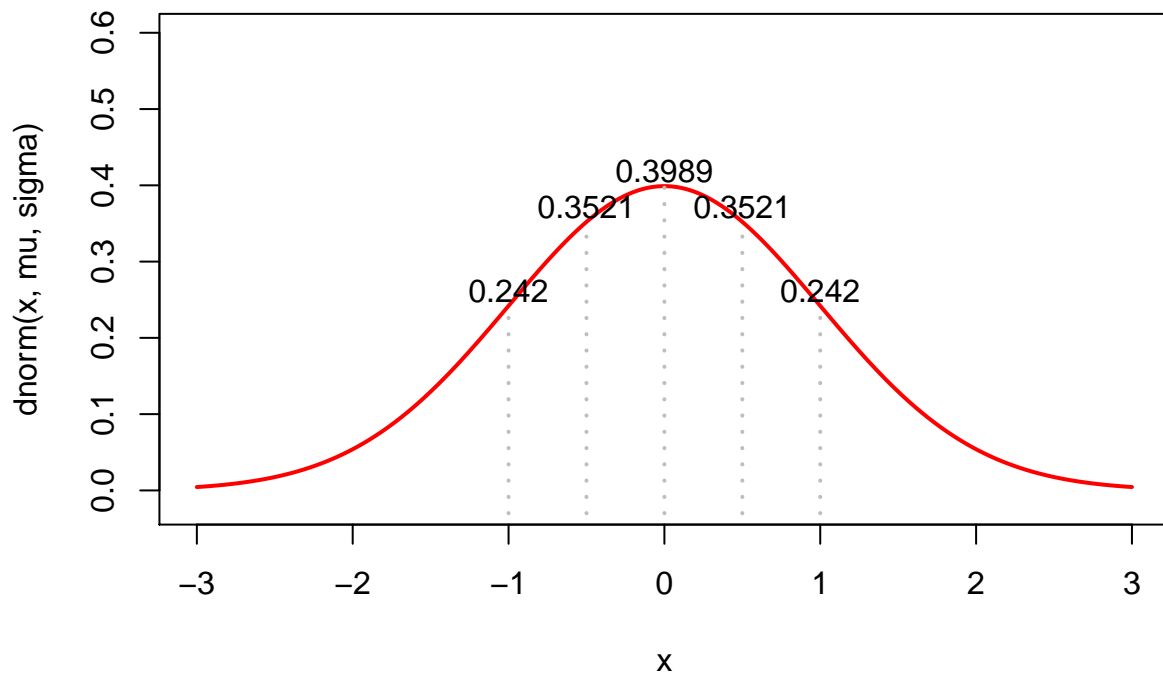


Calculating likelihood value of N(-1, 1)

```r
likelihood_1st= 1
for(y in yp){
  likelihood_1st = likelihood_1st*y
}
likelihood_1st
```

```
## [1] 0.0002376545
```

**2nd : likelihood of N(0, 1)**

```r
mu = 0; sigma = 1
x = seq(mu-3, mu+3, 0.01)
plot(x, dnorm(x, mu, sigma), type='l', lwd=2, col='red', ylim=c(-0.02, 0.6))
xp = seq(-1, 1, length=5)
yp = dnorm(xp, mu, sigma)
for(i in seq(1, 5, 1)){
  segments(xp[i], -0.03, xp[i], yp[i], col = 'gray', lty=3, lwd=2)
  text(xp[i], yp[i]+0.02, labels=round(yp[i], 4))
}
```



Calculating likelihood value of N(0, 1)

```r
likelihood_2nd = 1
for(y in yp){
  likelihood_2nd = likelihood_2nd * y
}
likelihood_2nd
```
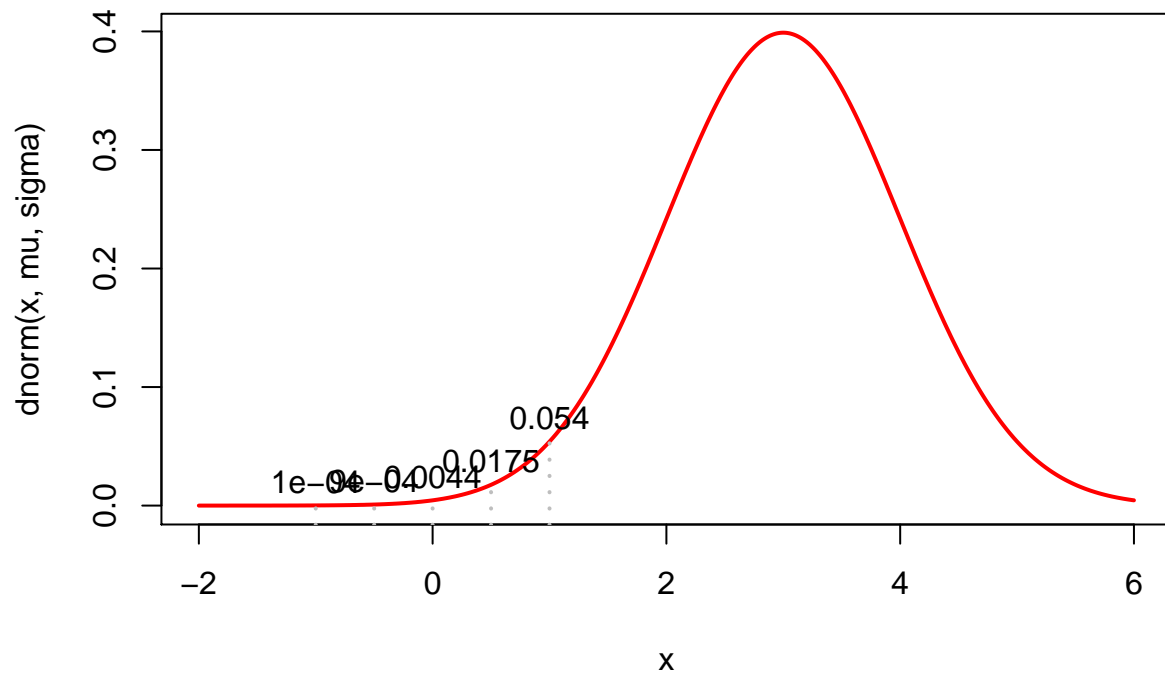
```
## [1] 0.002895224
```

**3rd : likelihood of N(3, 1)**

```
mu = 3; sigma = 1
x = seq(mu-5, mu+3, 0.01)
plot(x, dnorm(x, mu, sigma), type='l', lwd=2, col='red')
xp = seq(-1, 1, length=5)
yp = dnorm(xp, mu, sigma)
for(i in seq(1, 5, 1)){
  segments(xp[i], -0.03, xp[i], yp[i], col = 'gray', lty=3, lwd=2)
  text(xp[i], yp[i]+0.02, labels=round(yp[i], 4))
}
```



Calculating likelihood value of N(3, 1)

```
likelihood_3rd = 1
for(y in yp){
  likelihood_3rd = likelihood_3rd * y
}
likelihood_3rd
```

```
## [1] 4.898424e-13
```