CH3: Normal Probabilites

We use the pnorm() function to compute cumulative probabilities for the normal distribution.
We use the qnorm() function to compute inverse probabilities.
Remember: You can find help/more details using ?pnorm.

Ex1: $P(Z \leq 1.31)$

```
pnorm(1.31)
```

```
## [1] 0.9049021
```

Ex2: $P(Z > 1.72)$

```
1-pnorm(1.72)
```

```
## [1] 0.04271622
```

```
pnorm(1.72, lower.tail = FALSE)
```

```
## [1] 0.04271622
```

Ex3: z such that $P(Z > z) = 0.95$

```
qnorm(0.05)
```

```
## [1] -1.644854
```

```
qnorm(0.95, lower.tail = FALSE)
```

```
## [1] -1.644854
```

Ex4: $P(Y \leq 8)$

```
pnorm((8-5)/2)
```

```
## [1] 0.9331928
```

```
pnorm(8, mean = 5, sd = 2)
```

```
## [1] 0.9331928
```

Ex5: y such that $P(Y \leq y) = 0.975$

```
2*qnorm(0.975)+5
```

```
## [1] 8.919928
```

```
qnorm(0.975, mean = 5, sd = 2)
```

```
## [1] 8.919928
```

Plot of N(mu=5,sd=2)

```
x <- seq(-3, 13, length.out = 120)
plot(x, dnorm(x, mean = 5, sd = 2), xlab = "x", ylab = "f(x)",
main = expression(paste(mu, " = 5, ", sigma, " = 2")), type="l",lwd=2)
abline(h = 0, col = "gray", lwd = 2)
```