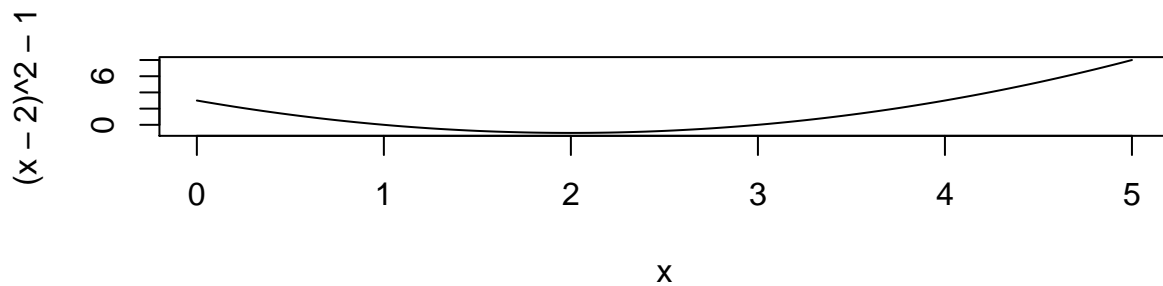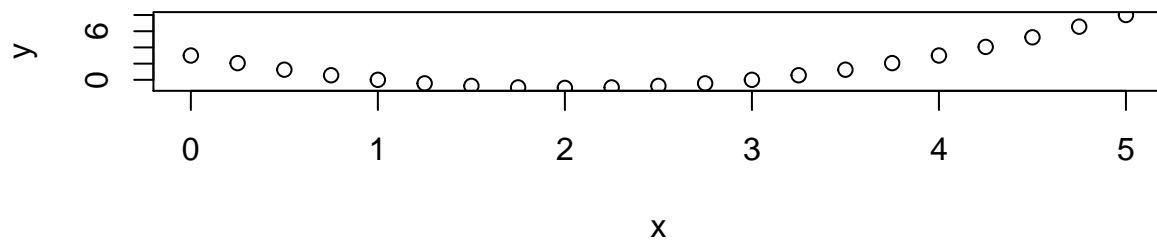# Biometrika 2017.03.01

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Grafikai

```
x = seq(0, 5, by=0.25)
head(x)
```

```
## [1] 0.00 0.25 0.50 0.75 1.00 1.25
```

```
y = (x-2)^2-1
par(mfrow=c(2,1))
plot(x, y)
curve((x-2)^2-1, from=0, to=5)
```



```
par(mfrow=c(1,1))
```

Data frame, list
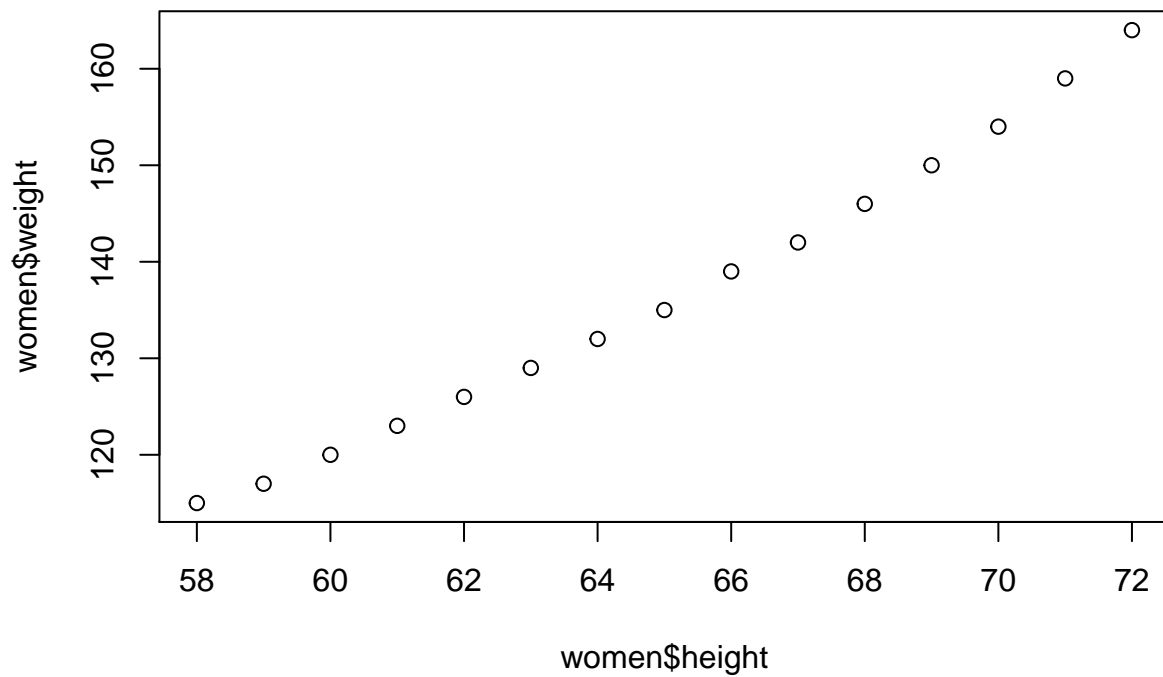
```
# help(women) # data file R
head(women)
```

```
##   height weight
## 1     58    115
## 2     59    117
## 3     60    120
## 4     61    123
## 5     62    126
## 6     63    129
```
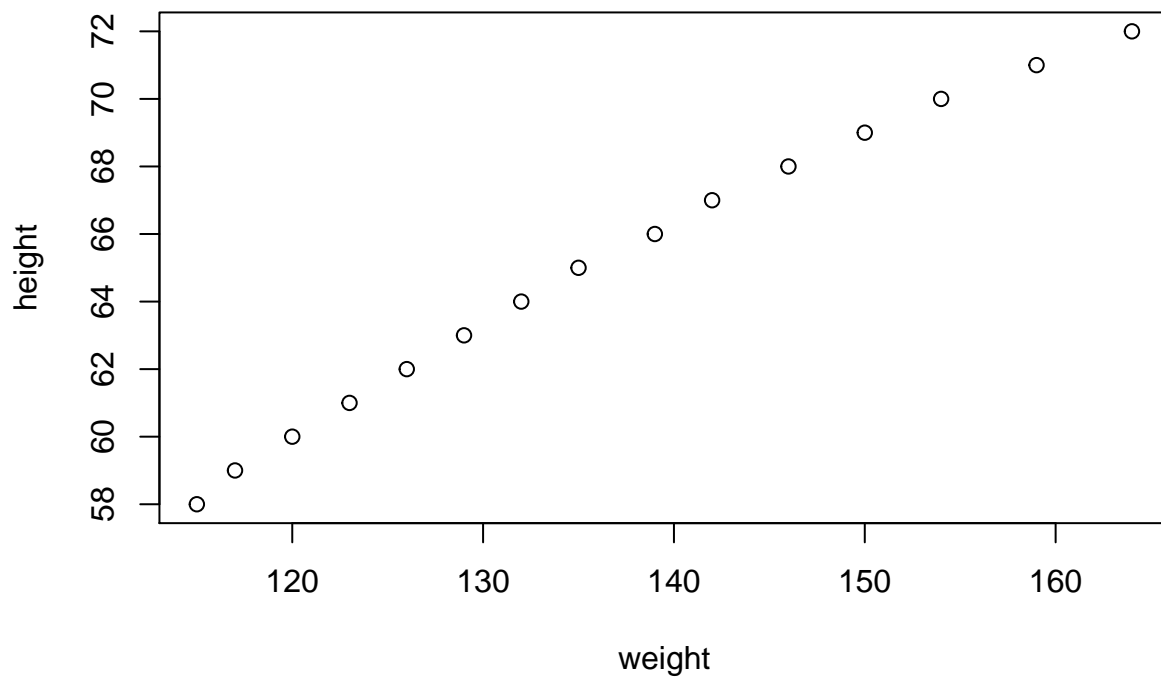
```
str(women) # structure
```

```
## 'data.frame':    15 obs. of  2 variables:
##  $ height: num  58 59 60 61 62 63 64 65 66 67 ...
##  $ weight: num  115 117 120 123 126 129 132 135 139 142 ...
```

```
plot(women$height, women$weight)
```



```
with(women, plot(weight, height))
```

```r
summary(women)
```

```
##     height      weight
## Min.   :58.0   Min.   :115.0
## 1st Qu.:61.5   1st Qu.:124.5
## Median :65.0   Median :135.0
## Mean   :65.0   Mean   :136.7
## 3rd Qu.:68.5   3rd Qu.:148.0
## Max.   :72.0   Max.   :164.0
```

```r
nrow(women)
```

```
## [1] 15
```

```r
ncol(women)
```

```
## [1] 2
```

```r
dim(women)
```

```
## [1] 15  2
```

```r
women[2:5,2]
```

```
## [1] 117 120 123 126
```

```r
z = seq(2,4)
x = seq(6, 10)
y = seq(5, 1)
# zx = data.frame(z, x) # klaida
```

```r
xy = data.frame(x,y)
xy
```

```
##    x y
## 1  6 5
## 2  7 4
## 3  8 3
## 4  9 2
## 5 10 1
```

```r
xz = list(a1=x, a2=z, a3=c(11,22))
xz
```

```
## $a1
## [1]  6  7  8  9 10
##
## $a2
## [1] 2 3 4
##
## $a3
## [1] 11 22
```

```r
lapply(xz, max)
```

```
## $a1
## [1] 10
##
## $a2
## [1] 4
##
## $a3
## [1] 22
```

```r
vapply(xz,max, 1) # rezultatas - vektorius, 1 - sio tipo vektoriaus komponentes
```
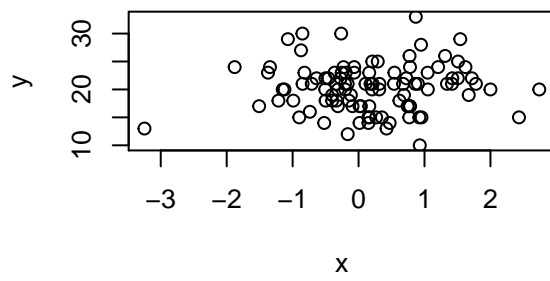
```
## a1 a2 a3
## 10  4 22
```

Scatter plot

```r
x <- rnorm(100)
y <- rpois(100, 20)
head(x)
```
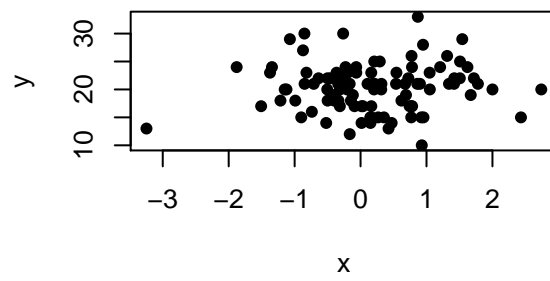
```
## [1] -0.8490018  1.4214737 -0.5215190  0.2669177 -1.3435387  0.5437866
```

```r
par(mfrow=c(2,2))
plot(x, y, main="pirmas")
plot(x, y, pch=16, main="antras")
plot(x, y, type="l", main="trecias")
plot(sort(x), sort(y), main="ketvirtas")
```
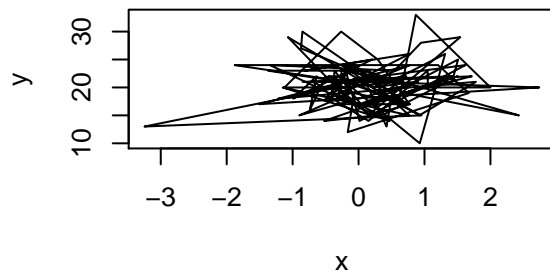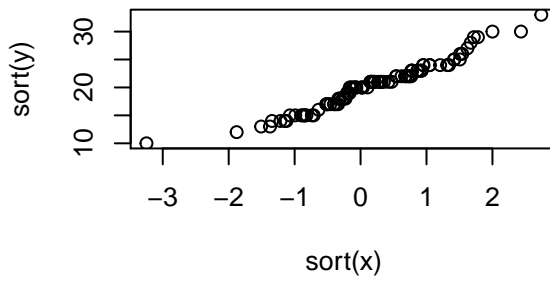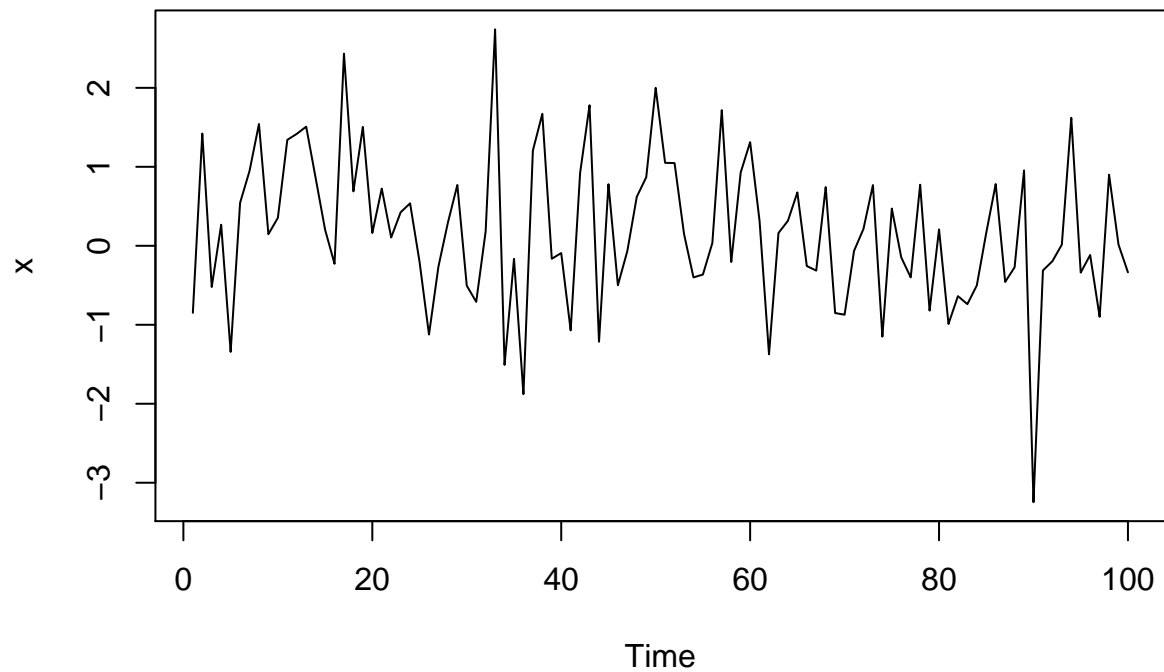
pirmas

antras

trecias

ketvirtas


```r
par(mfrow=c(1,1))
ts.plot(x) # time series - laiko eilutes
```

Ciklai, t.t.

```r
# for
n = 100
sandauga = 1
suma = 0
for (i in 1:n)
{
sandauga = sandauga * i
suma = suma + i
}
sandauga
```

```
## [1] 9.332622e+157
```

```r
suma
```

```
## [1] 5050
```

```r
# if
x = 6
if (x < 5) y = x^2 else y = -x^2
y
```

```
## [1] -36
```

```r
# while Fibonaci skaiciai mazesni uz 300
fib1 <- 1
fib2 = 1
fibonacci = c(fib1, fib2)
while (fib2 < 300)
{
fibonacci <- c(fibonacci,fib2)
oldfib2 = fib2
fib2 = fib1+fib2
fib1 = oldfib2
}
fibonacci
```

```
## [1]   1   1   1   2   3   5   8  13  21  34  55  89 144 233
```