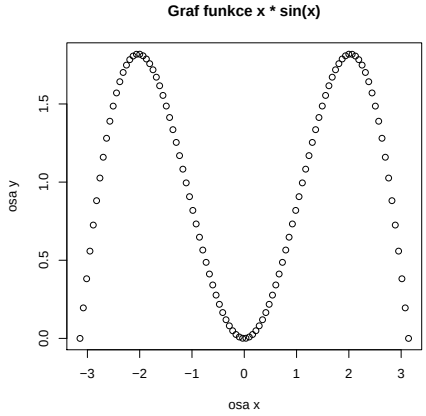
```
> source("cv4.R")
```

GRAFIKA V R
Na dalsi ukol se dostanete klavesou c nebo ENTER.

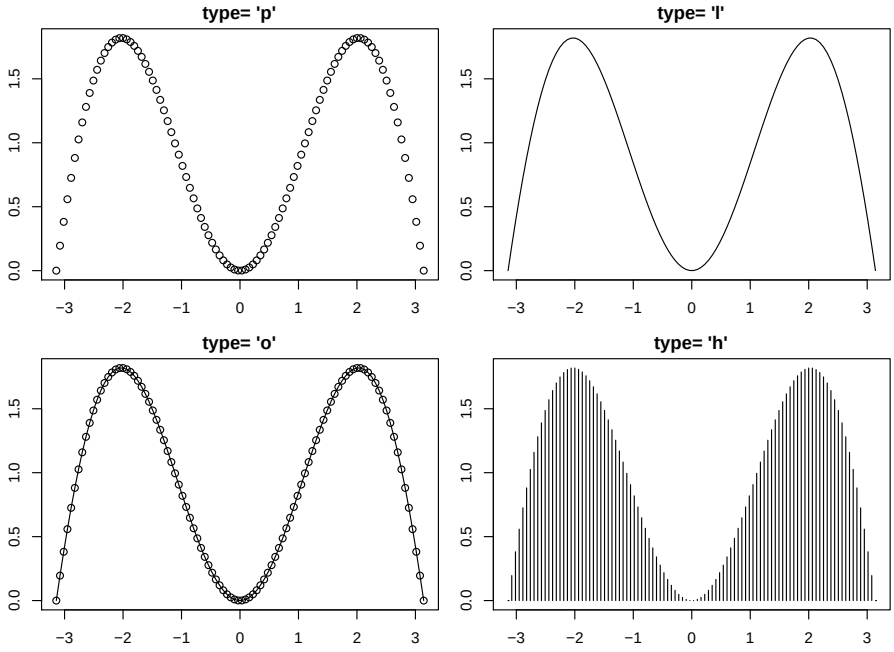
*1. Na intervalu [-pi, pi] vykreslete graf funkce x*sin(x).*
*Popiste radne osy a pridejte nazev grafu.*

```
Browse[1]> x <- seq(from=-pi, to=pi, length=100)
Browse[1]> y <- x*sin(x)
Browse[1]> plot(x, y, xlab="osa x", ylab="osa y", main="Graf funkce x*sin(x)")
```



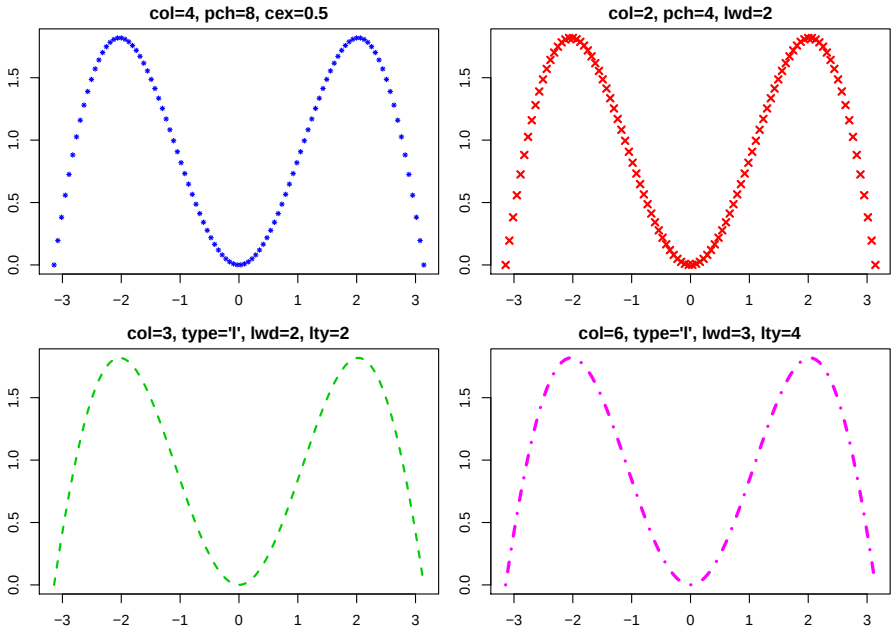

2. Vyzkousejte moznosti vykresleni pomoci argumentu "type".

```
Browse[2]> layout(matrix(1:4,2,byrow=T))
Browse[2]> plot(x, y, type= "p", main="type= 'p'")
Browse[2]> plot(x, y, type= "l", main="type= 'l'")
Browse[2]> plot(x, y, type= "o", main="type= 'o'")
Browse[2]> plot(x, y, type= "h", main="type= 'h'")
```



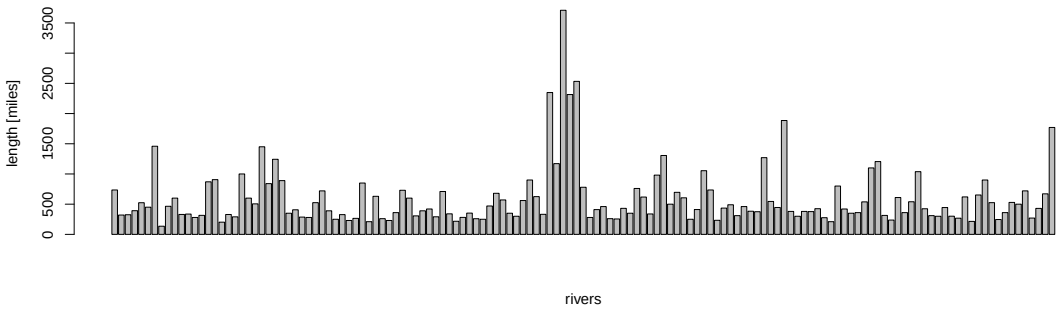
3. Zkuste menit barvy, velikosti a typy vykreslovanych bodu,
mente typy car.

```
Browse[2]> layout(matrix(1:4,2,byrow=T))
Browse[2]> plot(x, y, col=4, pch=8, cex=0.5, main="col=4, pch=8, cex=0.5")
Browse[2]> plot(x, y, col=2, pch=4, lwd=2, main="col=2, pch=4, lwd=2")
Browse[2]> plot(x, y, col=3, type="l", lwd=2, lty=2, main="col=3, type='l', lwd=2,
lty=2")
Browse[2]> plot(x, y, col=6, type="l", lwd=3, lty=4, main="col=6, type='l', lwd=3,
lty=4")
```

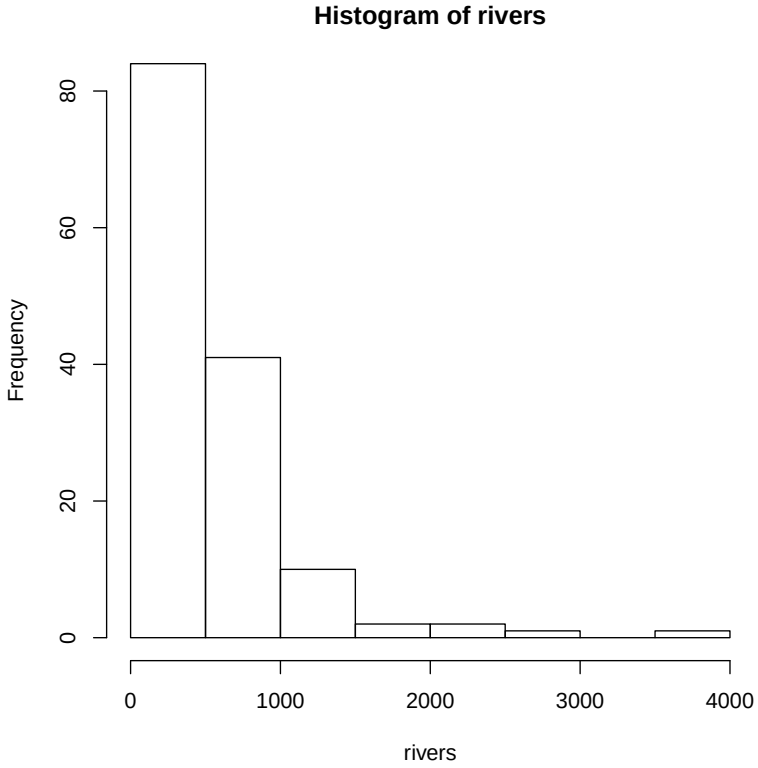



4. Pro delky severoamerickych rek (objekt "reky" v souboru "reky.dat")
vykreslete sloupcovy diagram, histogram, boxplot a stripchart. Pomoci
funkci "qqnorm" a "qqline" zjistete, zda se data ridi normalnim rozlozenim.

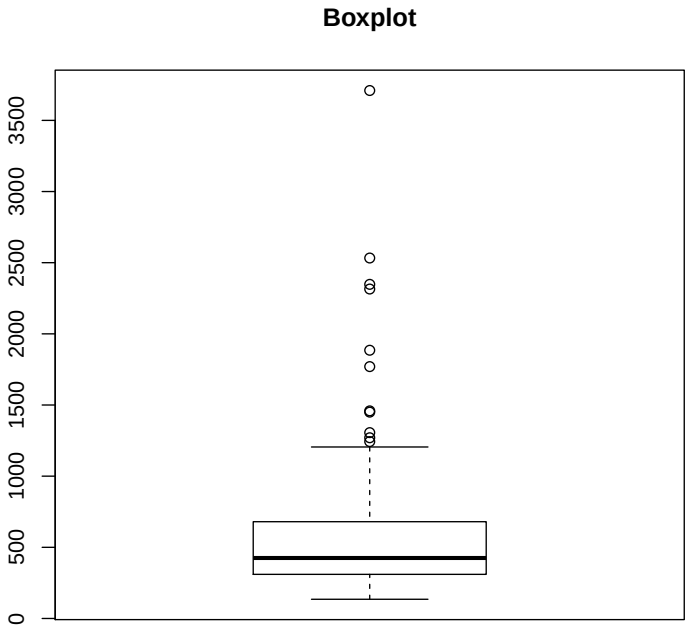
```
Browse[2]> load("reky.dat")
Browse[2]> barplot(rivers, xlab="rivers", ylab="length [miles]")
```



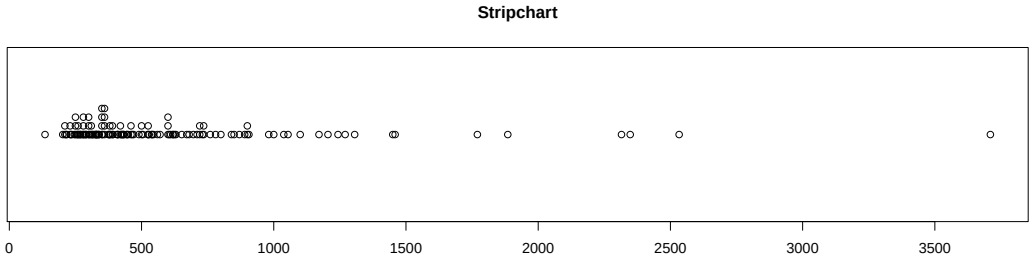
```
Browse[2]> hist(reky)
```



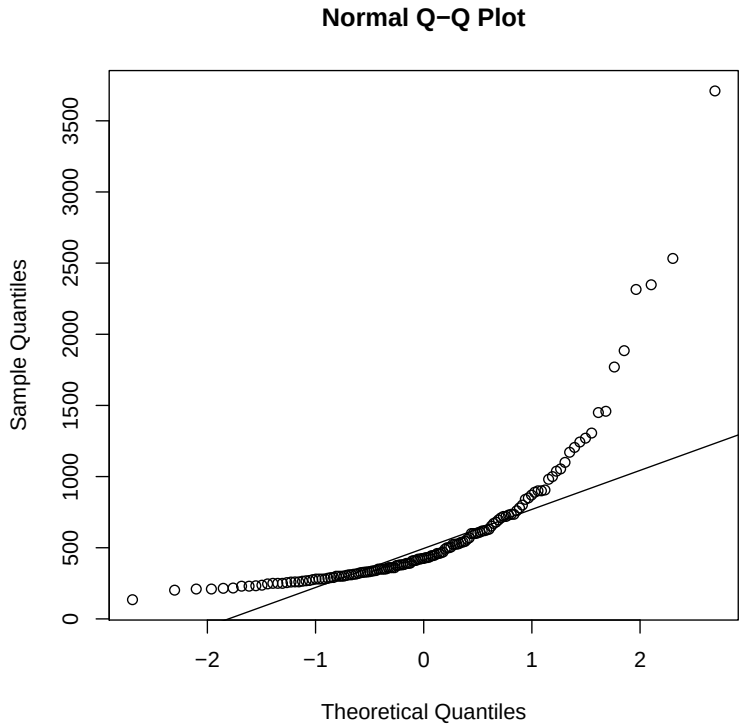

```
Browse[2]> boxplot(reky, main="Boxplot")
```



```
Browse[2]> stripchart(reky, main="Stripchart", method="stack", offset=0.5, pch=1)
```

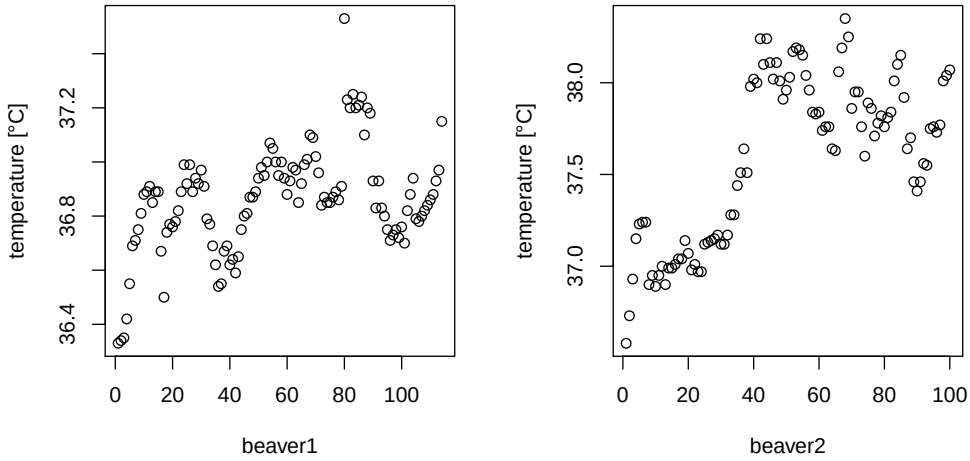



```
Browse[2]> qqnorm(reky)
Browse[2]> qqline(reky)
```



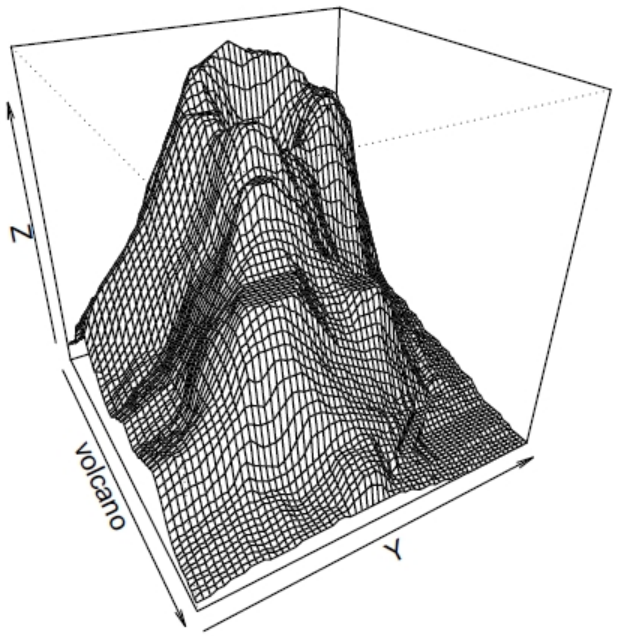
5. Do dvou samostatnych grafu vedle sebe zakreslete pozorovane teploty tela dvou bobru (vestavena data "beaver1", "beaver2").

```
Browse[2]> layout(matrix(c(1,2),1))
Browse[2]> plot(beaver1$temp, xlab="beaver_1", ylab="temperature [°C]")
Browse[2]> plot(beaver2$temp, xlab="beaver_2", ylab="temperature [°C]")
```



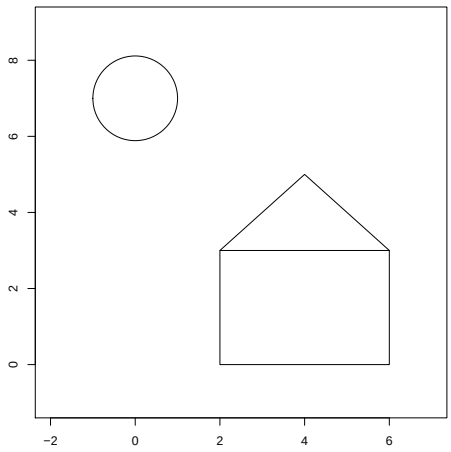

*6. Pomoci funkce "persp" zobrazte vulkan Mt. Eden (vestavena promenna "volcano"), vhodne pouzijte argumenty funkce k natoceni vulkanu.*

```
Browse[2]> persp(volcano, main="Persp", theta=60, phi=30)   ### natoceni vulkanu:
napr. o 60 stupnu ve vertikalnim smeru a o 30 stupnu v horizontalnim smeru
```



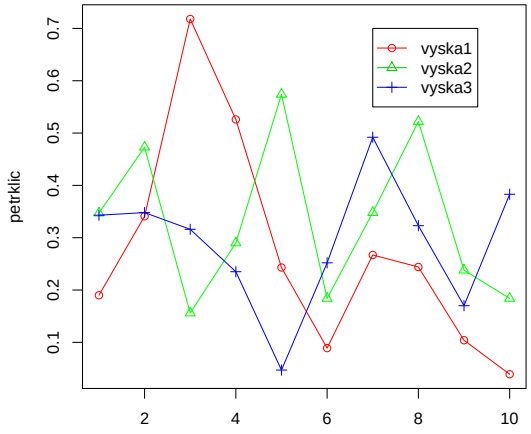
7. Pomoci low-level funkci vyzkousejte vykreslit jednoduche tvary:
 - kruznici se stredem v bode [0,7] a polomerem 1,
 - lomenou caru mezi body [2,3], [4,5], [6,3],
 - obdelnik s vrcholy v bodech [2,0], [2,3], [6,0], [6,3].

```
Browse[2]> symbols(0, 7, circles=1, inches=F, xlim=c(-2,7), ylim=c(-1,9), ann=F)
Browse[2]> x <- seq(from=2, to=6, by=2); y <- c(3, 5, 3)
Browse[2]> lines(x,y)
Browse[2]> rect(2, 0, 6, 3)
```




*8. Do jednoho grafu zobrazte zavislost vysky petrklice na vynos jeho osiva. Data jsou dostupna v souboru "petrklic.dat".*

```
Browse[2]> load("petrklic.dat")
Browse[2]> str(petrklic)
data.frame:  10 obs.  of 3 variables:
$ vyska1:  num 0.19 0.341 0.718 0.526 0.243 0.089 0.267 0.244 0.104 0.039
$ vyska2:  num 0.347 0.473 0.156 0.29 0.574 0.184 0.348 0.522 0.238 0.184
$ vyska3:  num 0.343 0.348 0.316 0.235 0.047 0.252 0.492 0.323 0.17 0.383
Browse[2]> matplot(petrklic, type="o", col=c("red", "green", "blue"), pch=1:3, lty=1)
Browse[2]> legend(7, 0.7, legend=colnames(petrklic), col=2:4, pch=1:3, lty=1)
```



*9. U 30 domacnosti byl zjistovan pocet clenu (data "domacnosti.dat"). Nakreslete graf empiricke distribucni funkce pro pocet clenu domacnosti.*

```
Browse[2]> source("domacnosti.R")
Browse[2]> domacnosti()
     PC  PD           P           F
 1    1   2  0.06666667  0.06666667
 2    2   6  0.20000000  0.26666667
 3    3   4  0.13333333  0.40000000
 4    4  10  0.33333333  0.73333333
 5    5   5  0.16666667  0.90000000
 6    6   3  0.10000000  1.00000000
```