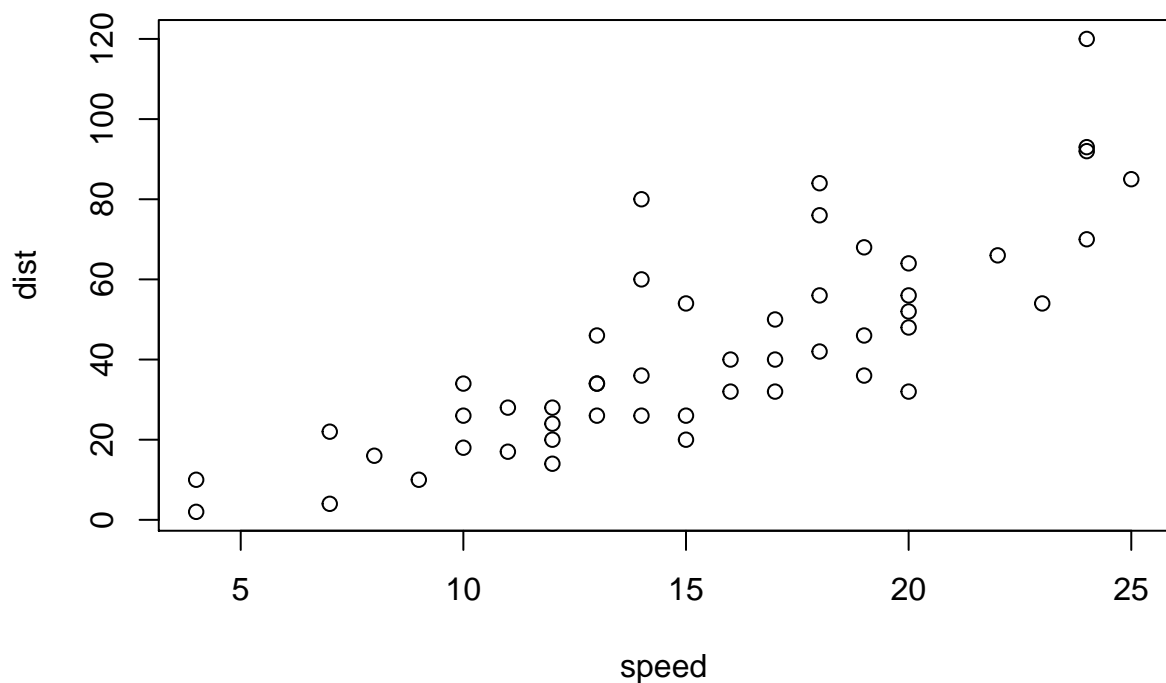# Aula 2

This is an R Markdown Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

```r
plot(cars)
```


Opérations basiques

```r
# Operações básicas (matemática)
v1 <- c(5, 8, 9, 6.25, 7, 7)
v2 <- c(7, 5, 10, 3, 3, 4)
soma = v1 + v2
```

```r
length(v1)
```

```
## [1] 6
```

```r
library(matlib)
```

```r
A <- matrix(c(2, 1, 1, -1), ncol = 2)
print(A)
```

```
##      [,1] [,2]
## [1,]    2    1
## [2,]    1   -1
```

```
B <- matrix(c(5, 6))
print(B)
```

```
##      [,1]
## [1,]    5
## [2,]    6
```
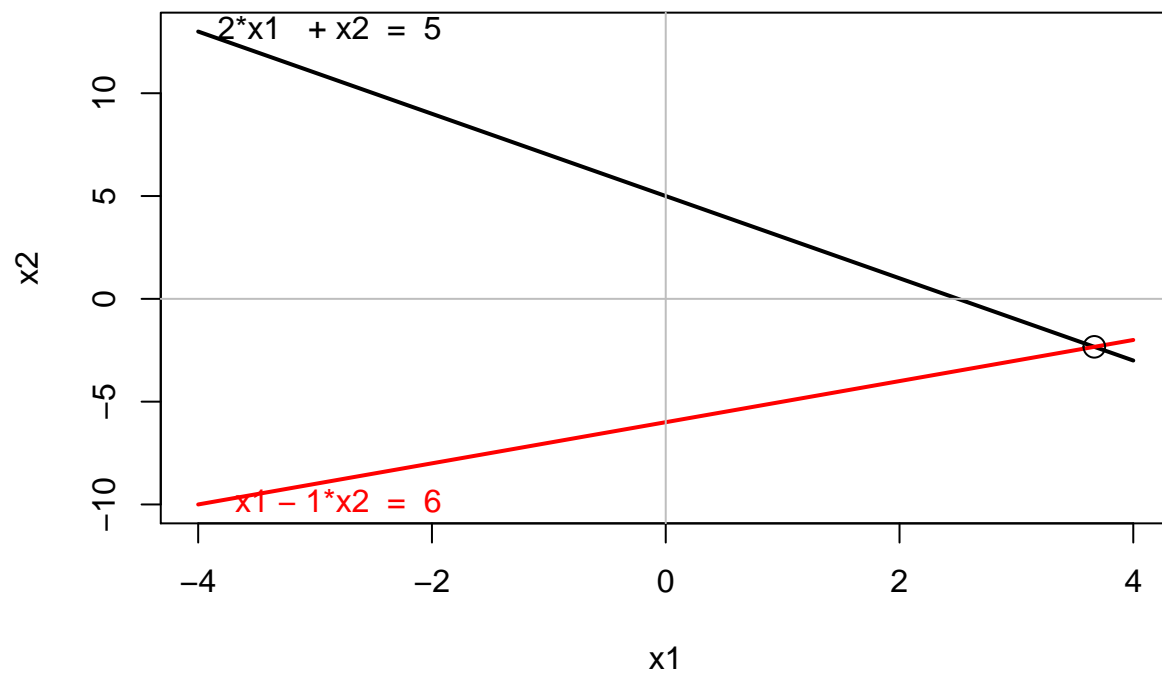
Visualização de sistemas de duas variáveis

```
showEqn(A, B)
```

```
## 2*x1 + 1*x2  =  5
## 1*x1 - 1*x2  =  6
```

```
plotEqn(A, B)
```

```
## 2*x1   + x2  =  5
##   x1 - 1*x2  =  6
```
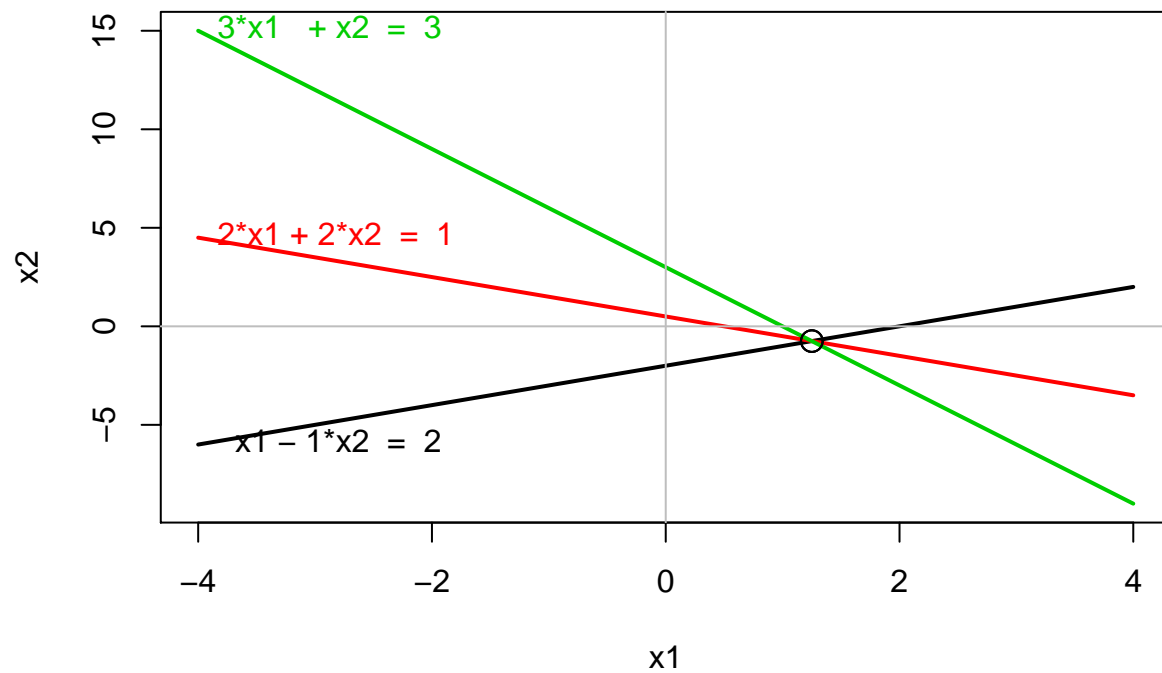


```
A <- matrix(c(1,2,3, -1, 2, 1), 3, 2)
B <- c(2,1,3)
```

```
showEqn(A,B)
```

```
## 1*x1 - 1*x2  =  2
## 2*x1 + 2*x2  =  1
## 3*x1 + 1*x2  =  3
```

```
plotEqn(A, B)
```

```
##   x1 - 1*x2  =  2
## 2*x1 + 2*x2  =  1
## 3*x1   + x2  =  3
```
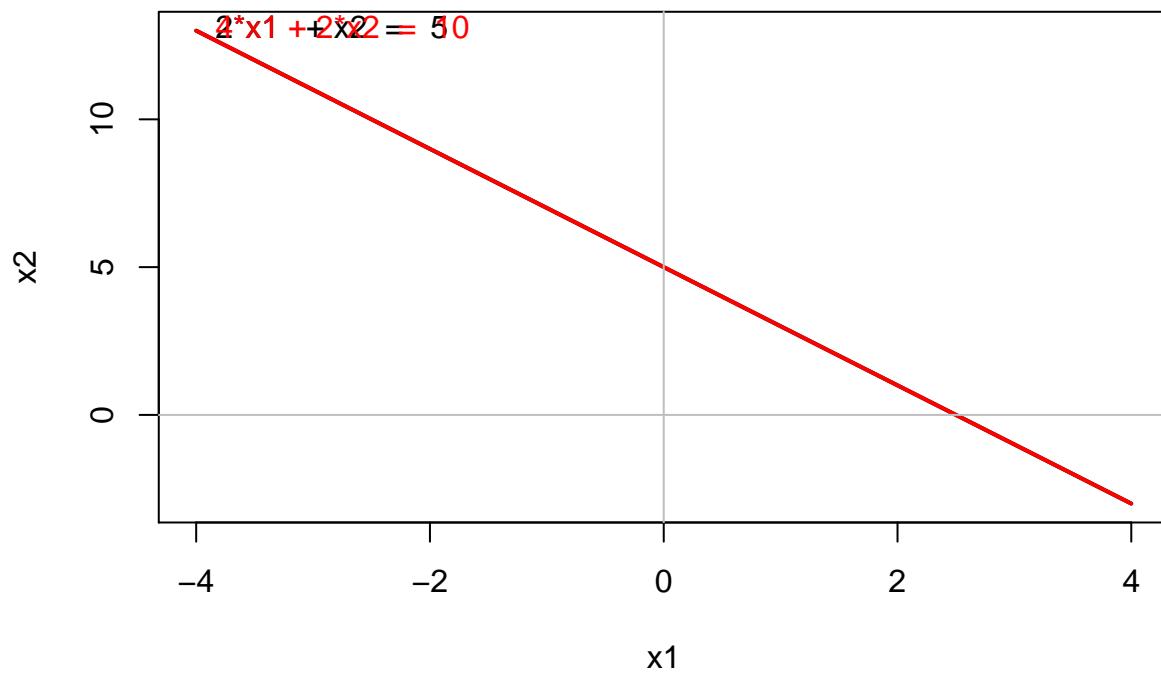


```
A <- matrix( c(2,4,1,2), ncol=2 )
B <- matrix( c(5,10) )

showEqn(A,B)
```

```
## 2*x1 + 1*x2  =   5
## 4*x1 + 2*x2  =  10
```

```
plotEqn(A, B)
```

```
## 2*x1   + x2  =   5
## 4*x1 + 2*x2  =  10
```
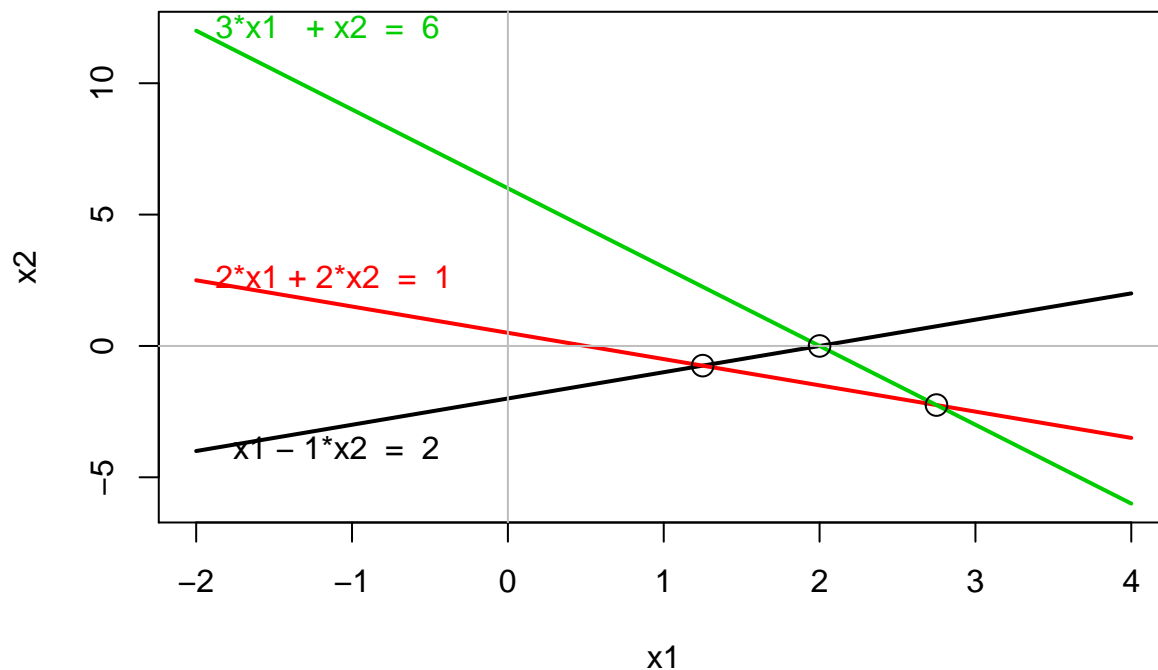
```
A <- matrix(c(1,2,3, -1, 2, 1), 3, 2)
B <- c(2,1,6)

showEqn(A,B)
```

```
## 1*x1 - 1*x2  =  2
## 2*x1 + 2*x2  =  1
## 3*x1 + 1*x2  =  6
```

```
plotEqn(A, B, xlim = c(-2, 4))
```

```
##   x1 - 1*x2  =  2
## 2*x1 + 2*x2  =  1
## 3*x1   + x2  =  6
```

```r
A <- matrix(c(6,2,3, 2, 4, 2, 1, 1, 8), 3, 3)
B <- c(7,7,13)

plotEqn3d(A,B, xlim=c(0,4), ylim=c(0,4))
```

```r
A <- matrix(c(1, 3, 1, 1, -2, -2, 2, 1, -1), 3, 3, byrow=TRUE)

# podemos alterar os nomes das linhas e colunas

colnames(A) <- paste0('x', 1:3) # equivale ao paste(...,sep="")
rownames(A) <- paste0('x', 1:3)
print(A)
```

```
##    x1 x2 x3
## x1  1  3  1
## x2  1 -2 -2
## x3  2  1 -1
```

```r
B <- c(2, 3, 6)

showEqn(A, B)
```

```
## 1*x1 + 3*x2 + 1*x3  =  2
## 1*x1 - 2*x2 - 2*x3  =  3
## 2*x1 + 1*x2 - 1*x3  =  6
```

```r
plotEqn3d(A, B, xlim = c(0, 4), ylim = c(0, 4))
```

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.