Gráficos

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x^2 LaTeX

Gráficos con la función `plot`

```
x = c(2,6,4,9,-1)
y = c(1,8,4,-2,4)
plot(x,y)
```

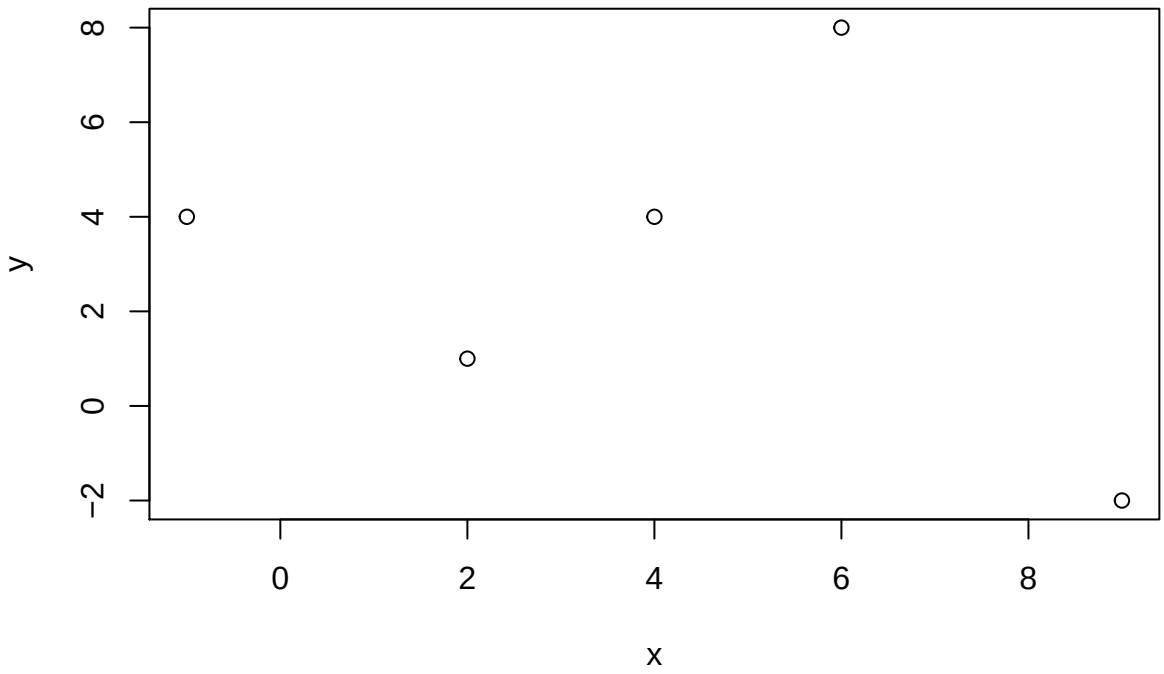
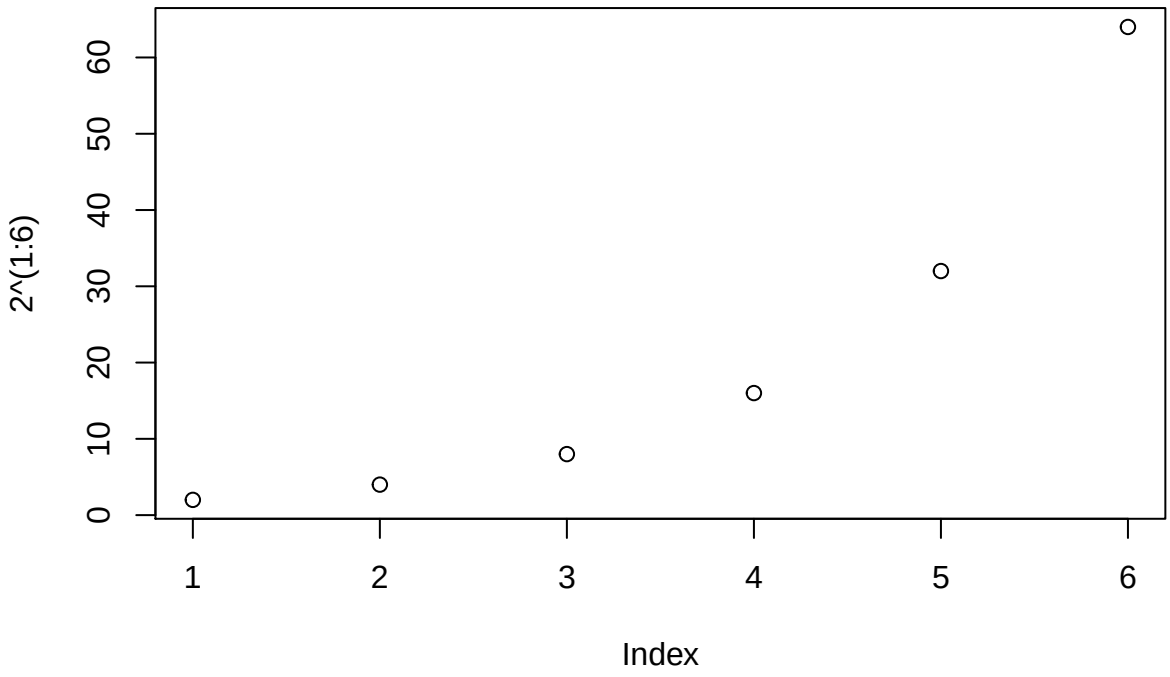


Figure 1: Gráfico básico explicando el uso del plot

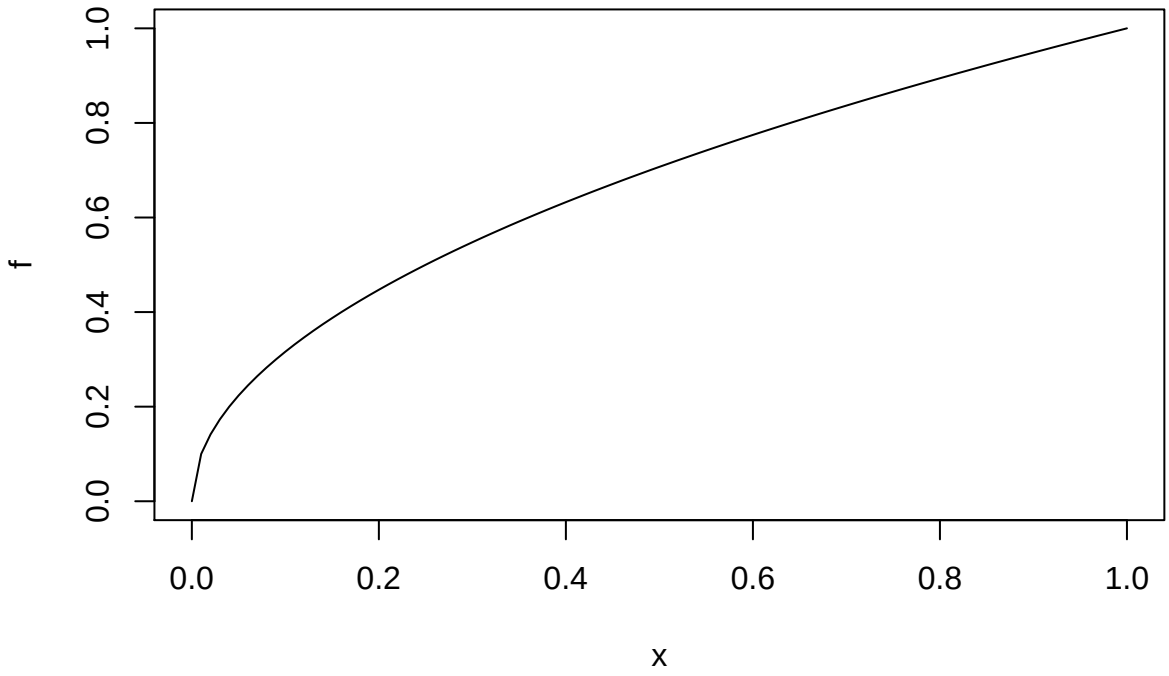
Si no incorporamos vector `y`, `R` nos va a tomar el parámetro `x` como si fuese el vector de datos `y` : plot(1:n, x)

```r
plot(2^(1:6))
```



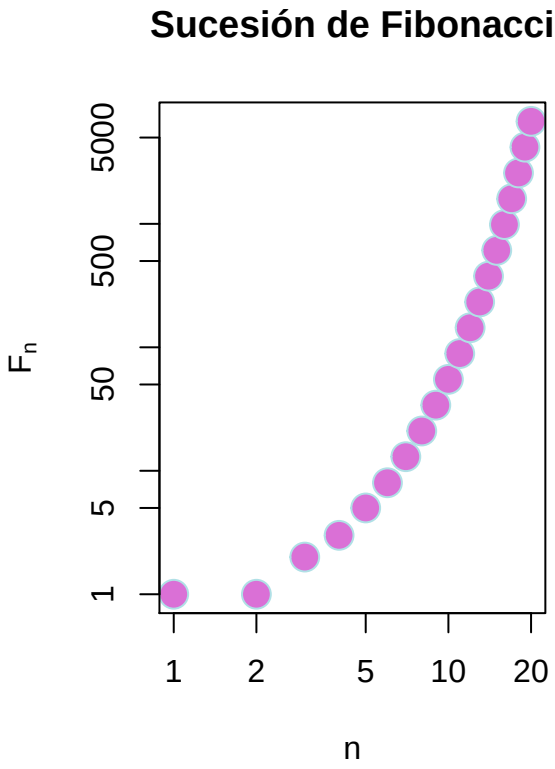
Si queremos representar una función $f(x)$:

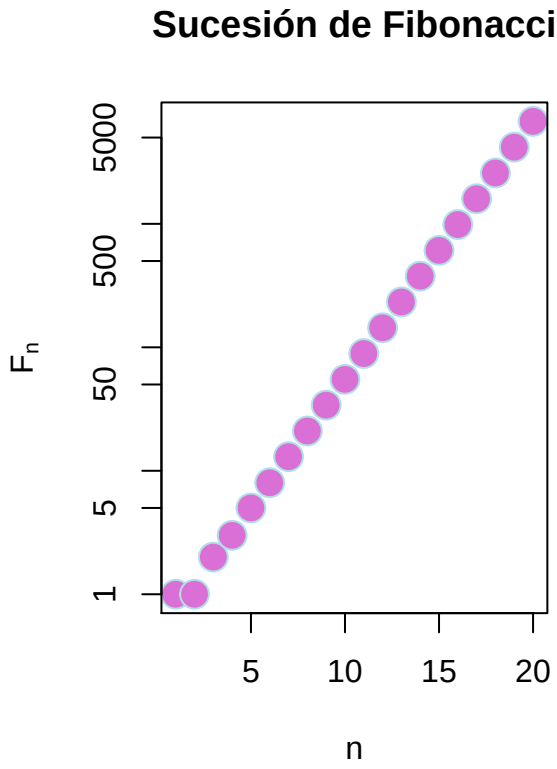
```r
f <- function(x){
  sqrt(x)
}
plot(f)
```



Parámetros

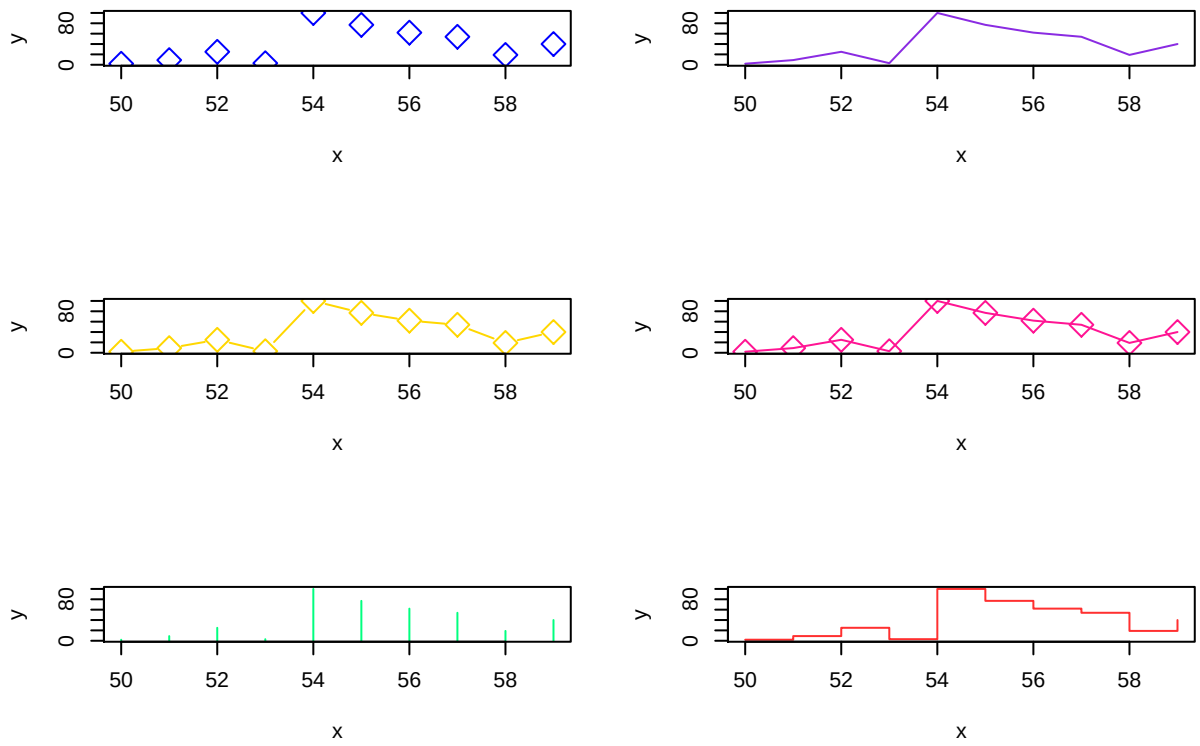
```
##  [1]    1    1    2    3    5    8   13   21   34   55   89  144  233  377  610
## [16]  987 1597 2584 4181 6765
```





Gráficas diapositivas

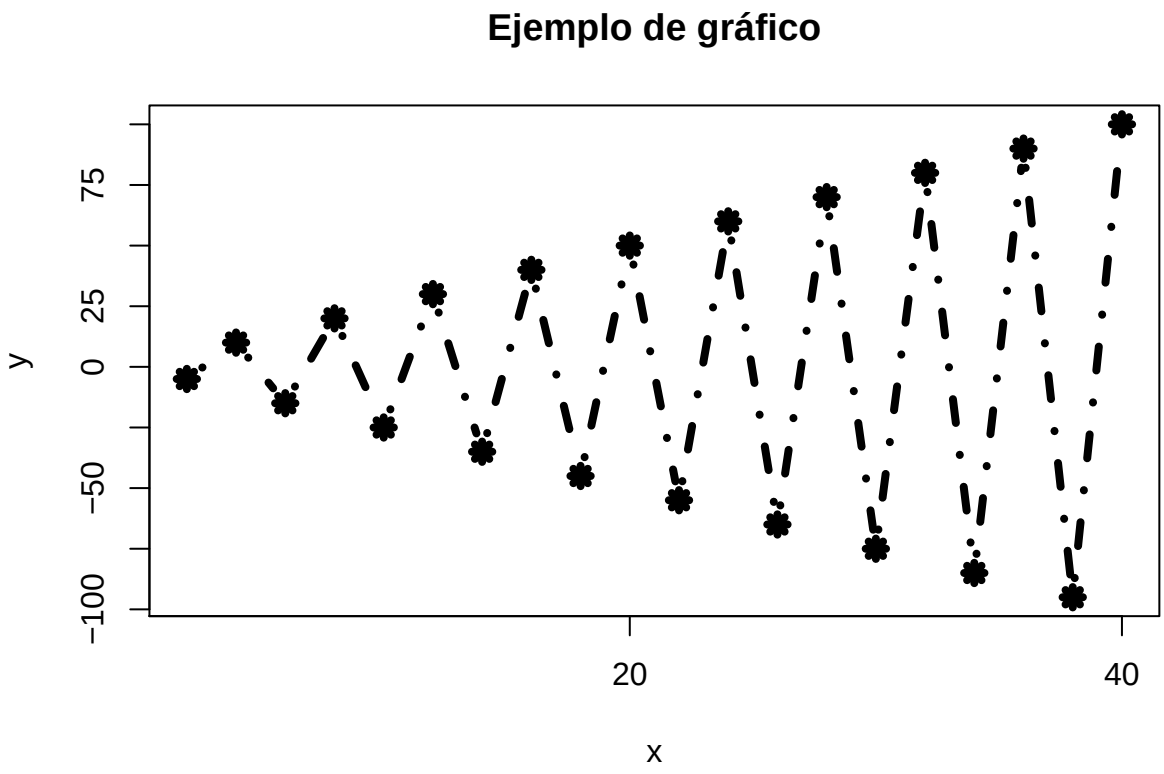
```
par(mfrow = c(3,2))
x = c(50:59)
y = c(2,9,25,3,100,77,62,54,19,40)
plot(x,y,pch = 23,cex = 2, col = "blue", type = "p")
plot(x,y,pch = 23,cex = 2, col = "blueviolet", type = "l")
plot(x,y,pch = 23,cex = 2, col = "gold", type = "b")
plot(x,y,pch = 23,cex = 2, col = "deeppink", type = "o")
plot(x,y,pch = 23,cex = 2, col = "springgreen", type = "h")
plot(x,y,pch = 23,cex = 2, col = "firebrick1", type = "s")
```




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

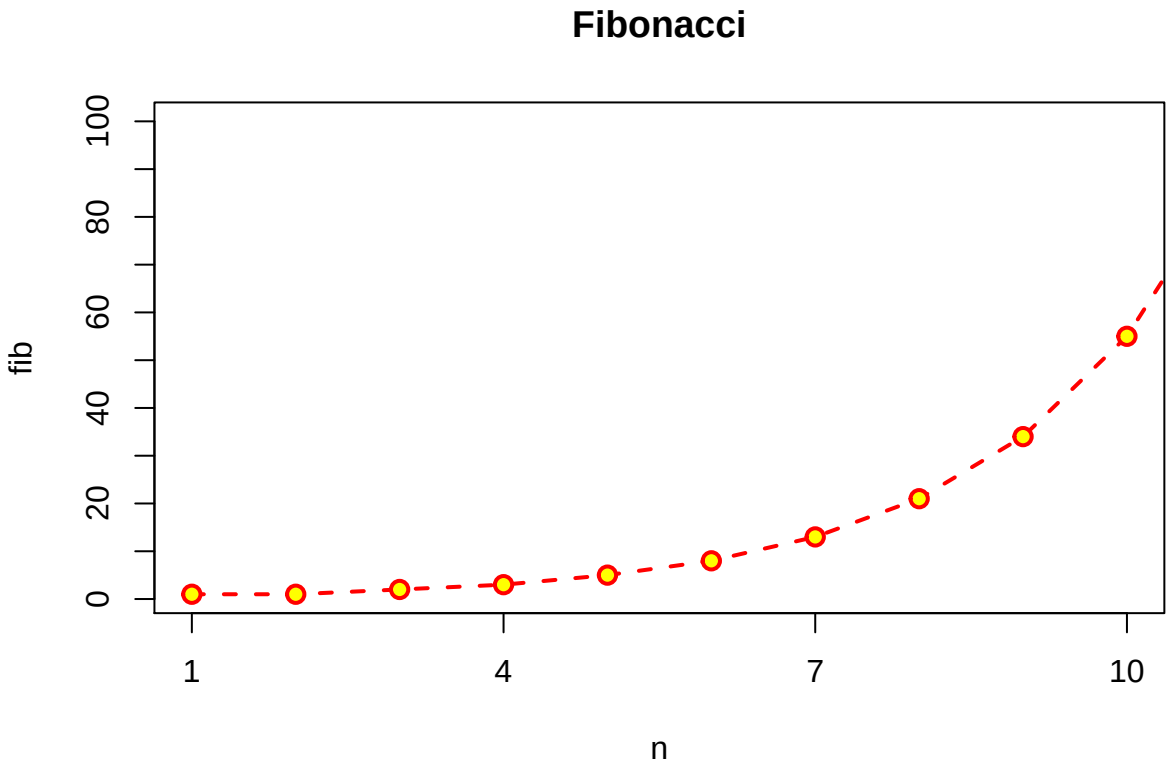
Otro ejemplo

```
x = (2*(1:20))
y = (-1)^(1:20)*5*(1:20)
plot(x,y,main="Ejemplo de gráfico",pch = 8,cex = 1,type = "b",lty = 4, lwd = 4, xaxp = c(0,40,2), yaxp =
```



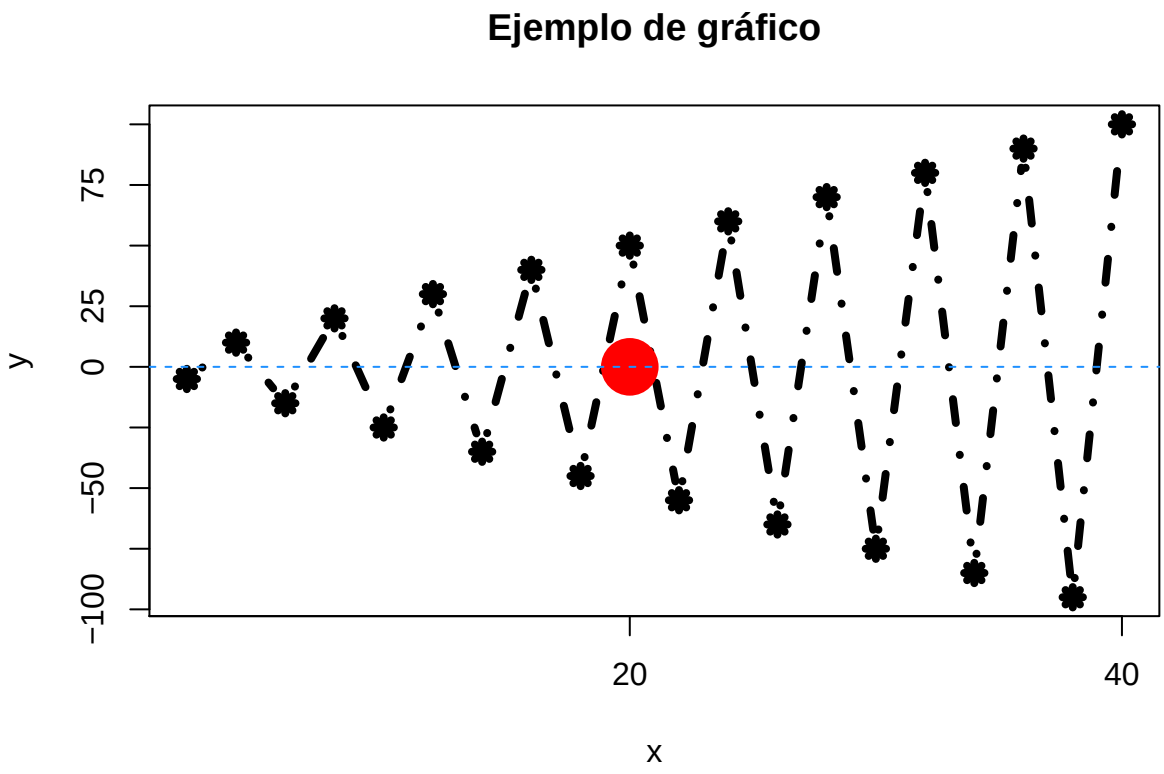
Un ejemplo más

```
plot(n,fib, pch = 21, col = "red", bg = "yellow", cex = 1.2,
     main = "Fibonacci",type = "o", lty = "dashed", lwd = 2, xlim = c(1,10),
     ylim = c(1,100), xaxp = c(1,10,3), yaxp = c(0,100,10))
```



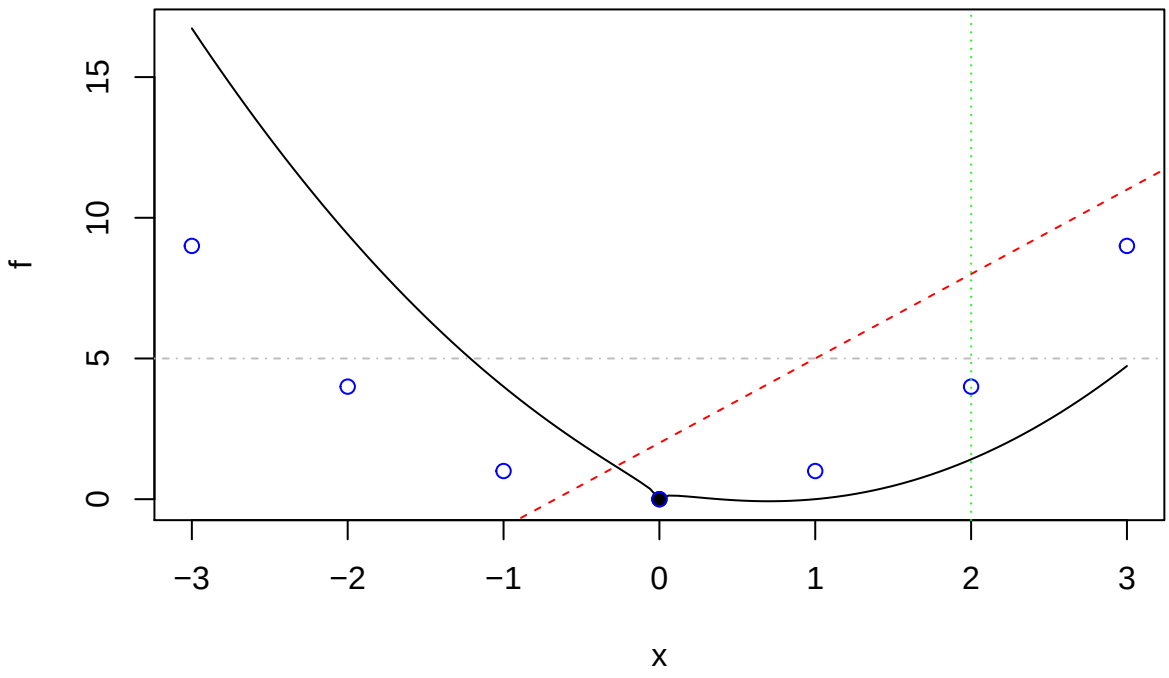
Añadiendo punto y recta

```
x = (2*(1:20))
y = (-1)^(1:20)*5*(1:20)
plot(x,y,main="Ejemplo de gráfico",pch = 8,cex = 1,type = "b",lty = 4, lwd = 4, xaxp = c(0,40,2), yaxp =
points(20,0, col = "red", cex = 4, pch = 16)
abline(h = 0,lty = 2,col = "dodgerblue")
```

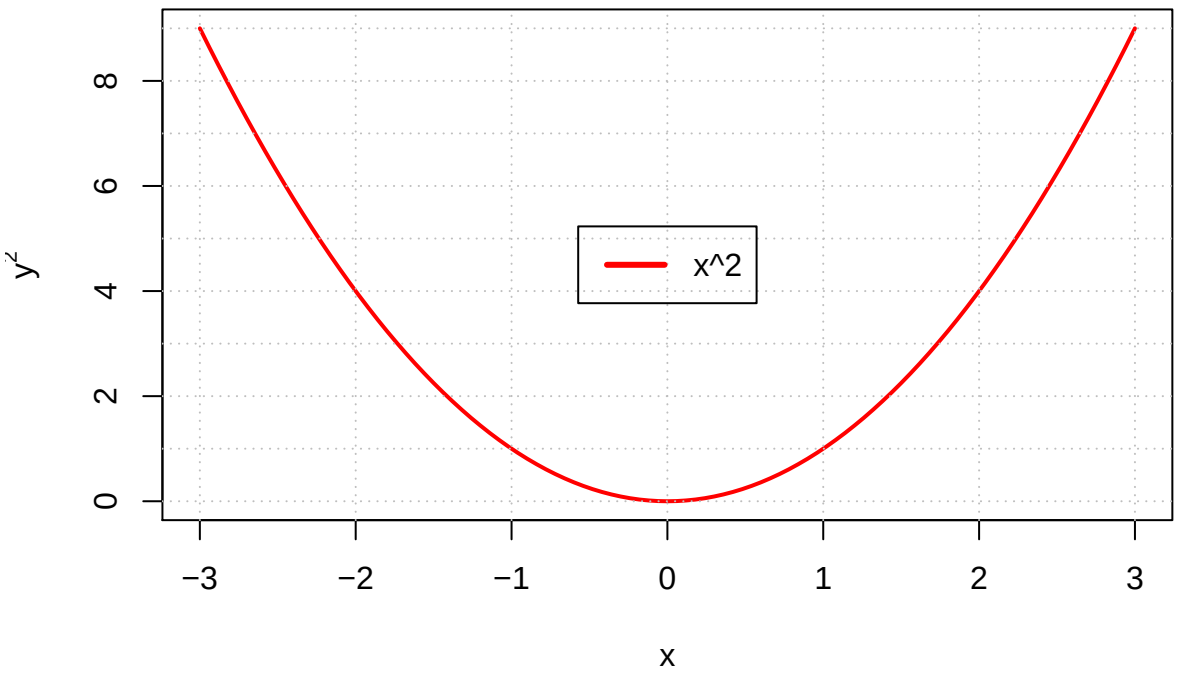


Cómo añadir elementos a un gráfico

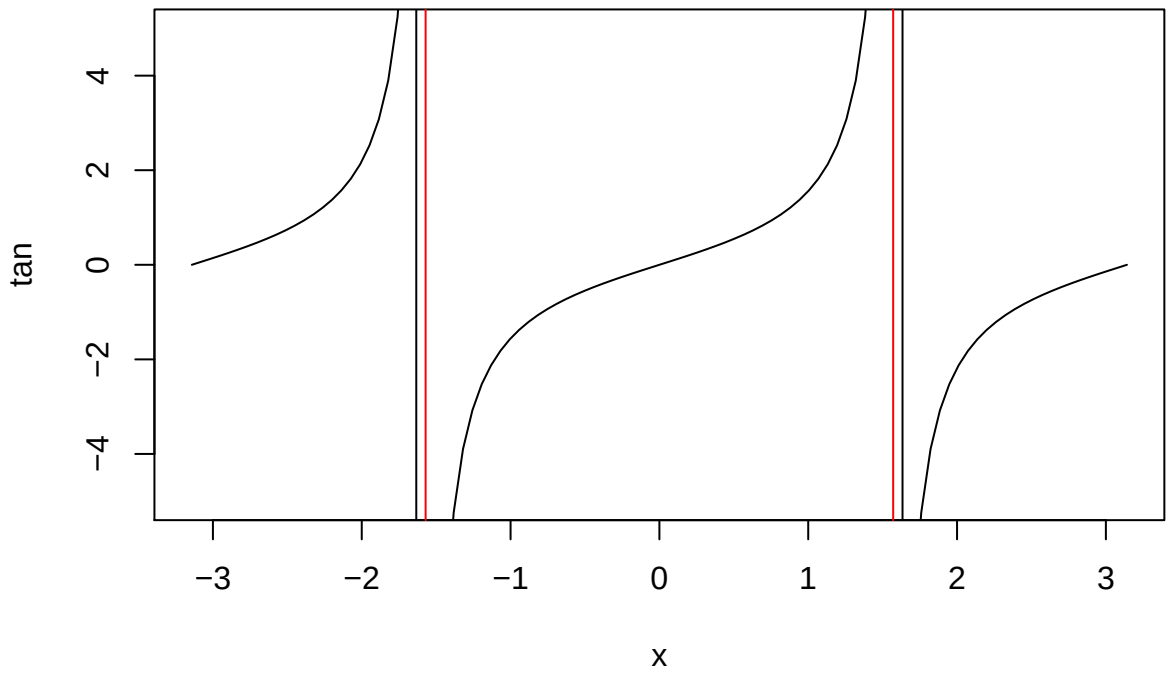
```
f <- function(x){
  x^2 - 2*x + sqrt(abs(x))
}
plot(f,xlim = c(-3,3))
points(0,0,pch = 19)
points(-3:3,(-3:3)^2,col = "blue")
abline(2,3,lty = "dashed",col = "red")
abline(v = 2,lty = "dotted",col = "green")
abline(h = 5,lty = "dotdash", col = "gray")
```




```
f <- function(x){x^2}
plot(f,xlim = c(-3,3),col="red",lwd = 2,ylab = expression(y^2),xlab = "x")
abline(h = 0:9, v = -3:3,lty = "dotted",col = "gray")
legend("center",
       col = c("red"),
       legend = "x^2",
       lwd = 3,
       bty = "l")
```

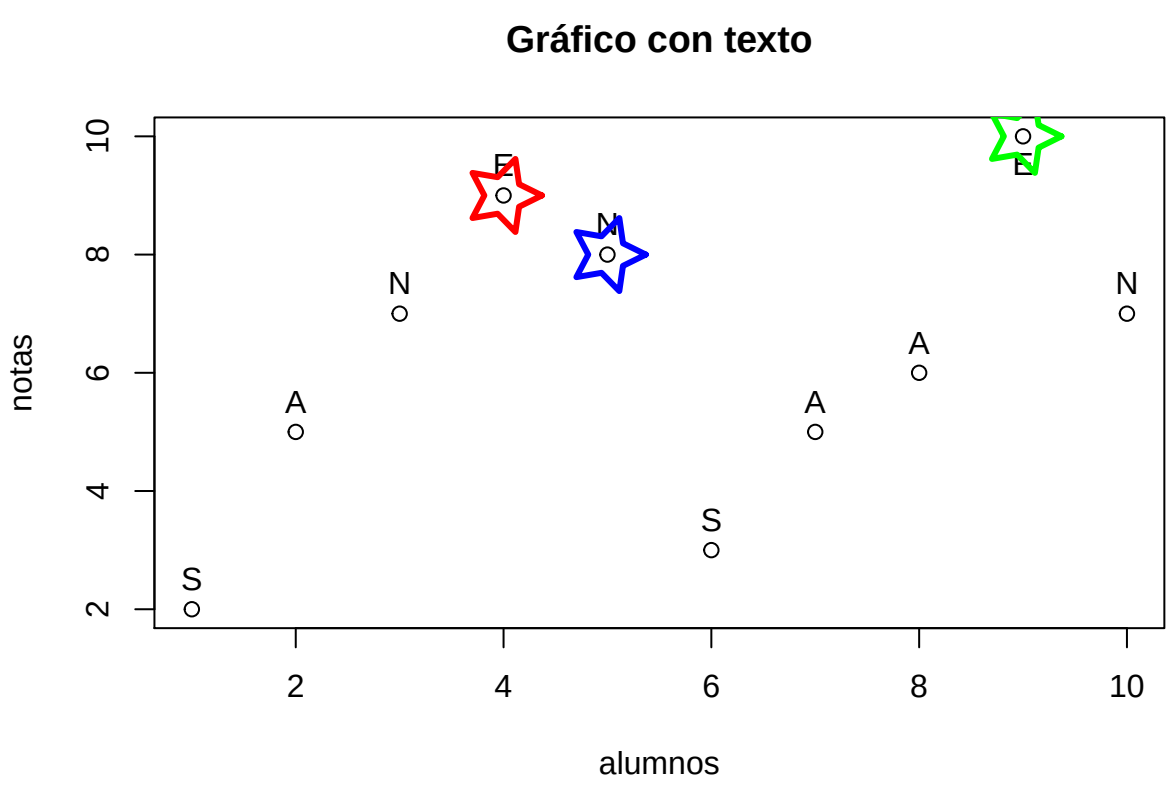



```
plot(tan,xlim = c(-pi,pi),ylim = c(-5,5))
abline(v = c(-pi/2,pi/2),col = "red")
```

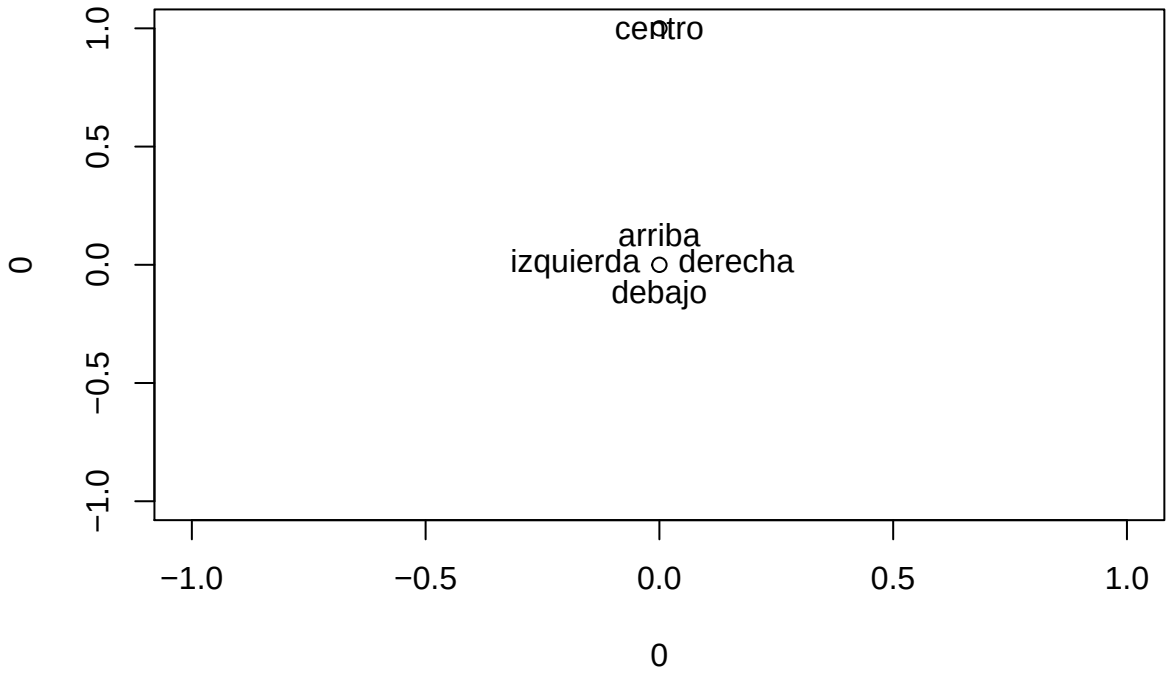


Añadiendo etiquetas (ejemplo)

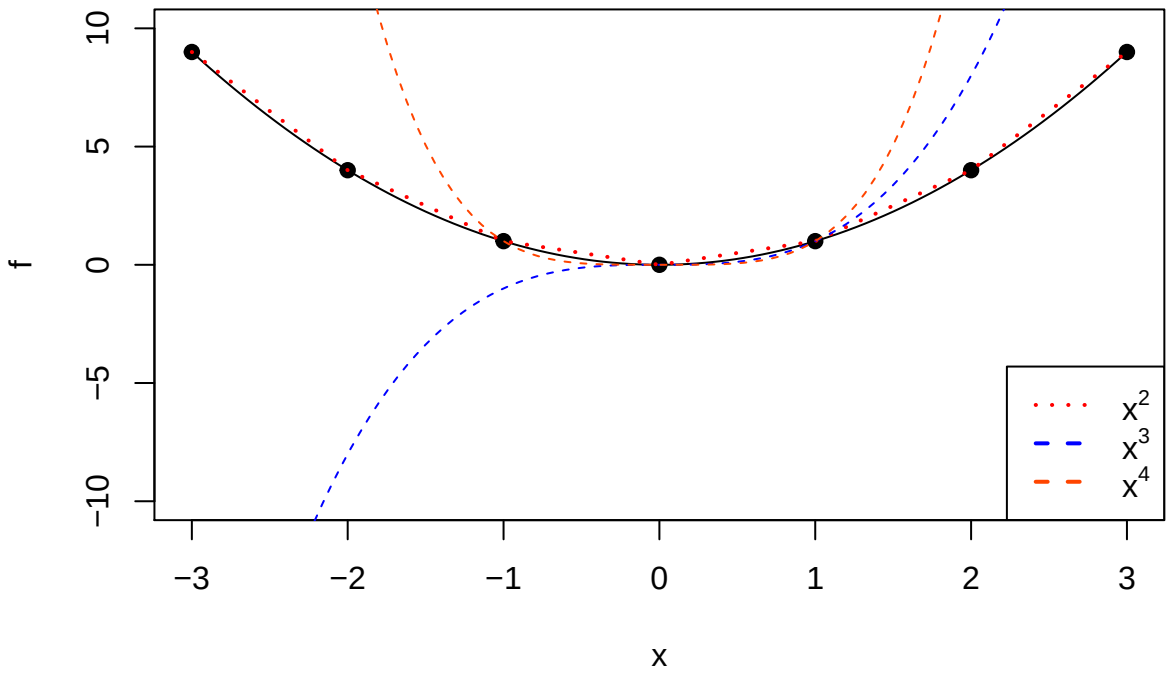
```
alumnos = c(1:10)
notas = c(2,5,7,9,8,3,5,6,10,7)
plot(alumnos,notas,main = "Gráfico con texto")
text(alumnos,notas,labels = c("S","A","N","E","N","S","A","A","E","N"),pos = c(rep(3,times = 8),1,3))
symbols(5,8,stars = cbind(1,.5,1,.5,1,.5,1,.5,1,.5),add = TRUE,lwd = 3,inches = 0.2,fg = "blue")
symbols(4,9,stars = cbind(1,.5,1,.5,1,.5,1,.5,1,.5),add = TRUE,lwd = 3,inches = 0.2,fg = "red")
symbols(9,10,stars = cbind(1,.5,1,.5,1,.5,1,.5,1,.5),add = TRUE,lwd = 3,inches = 0.2,fg = "green")
```




```
plot(0,0)
text(0,0,labels = "debajo",pos = 1)
text(0,0,labels = "izquierda",pos = 2)
text(0,0,labels = "arriba",pos = 3)
text(0,0,labels = "derecha",pos = 4)
points(0,1)
text(0,1,labels = "centro")
```

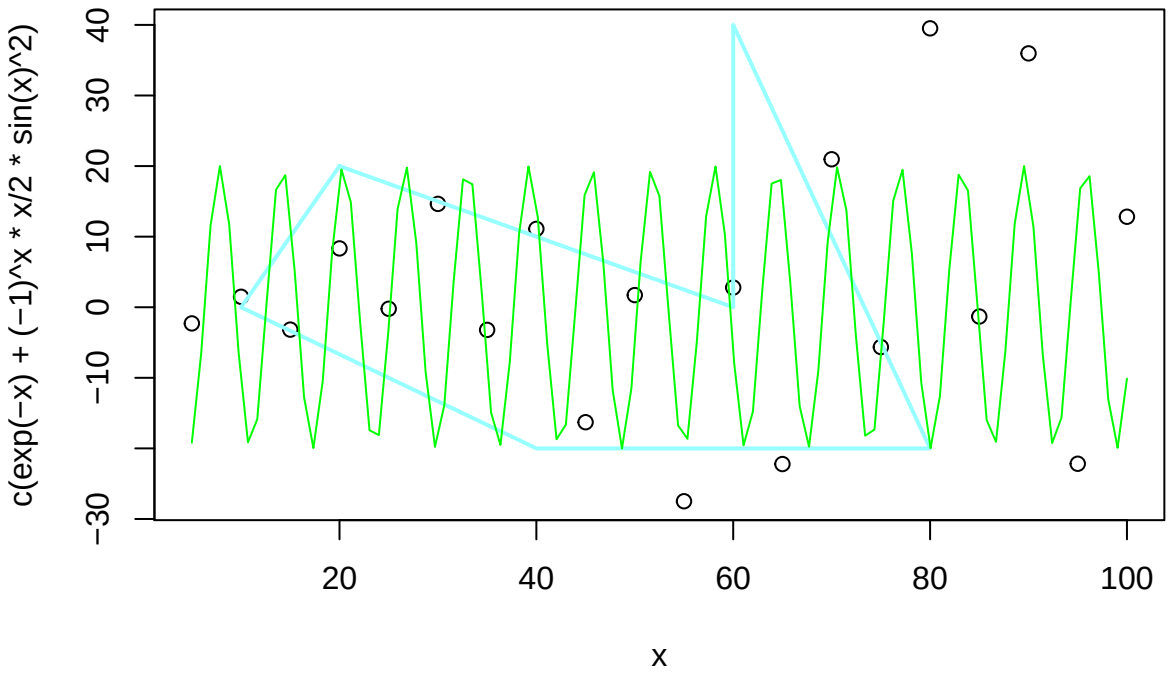



```
f <- function(x){x^2}
plot(f,xlim = c(-3,3),ylim = c(-10,10))
points(-3:3,f(-3:3),pch = 19)
lines(-3:3,f(-3:3),lwd = 2,lty = "dotted",col = "red")
curve(x^3,lty = "dashed",col = "blue",add = TRUE)
curve(x^4,lty = "dashed",col = "orangered",add = TRUE)
legend("bottomright",
       legend = c(expression(x^2),expression(x^3),expression(x^4)),
       lwd = 2,
       col = c("red","blue","orangered"),
       lty = c("dotted","dashed","dashed")
       )
```



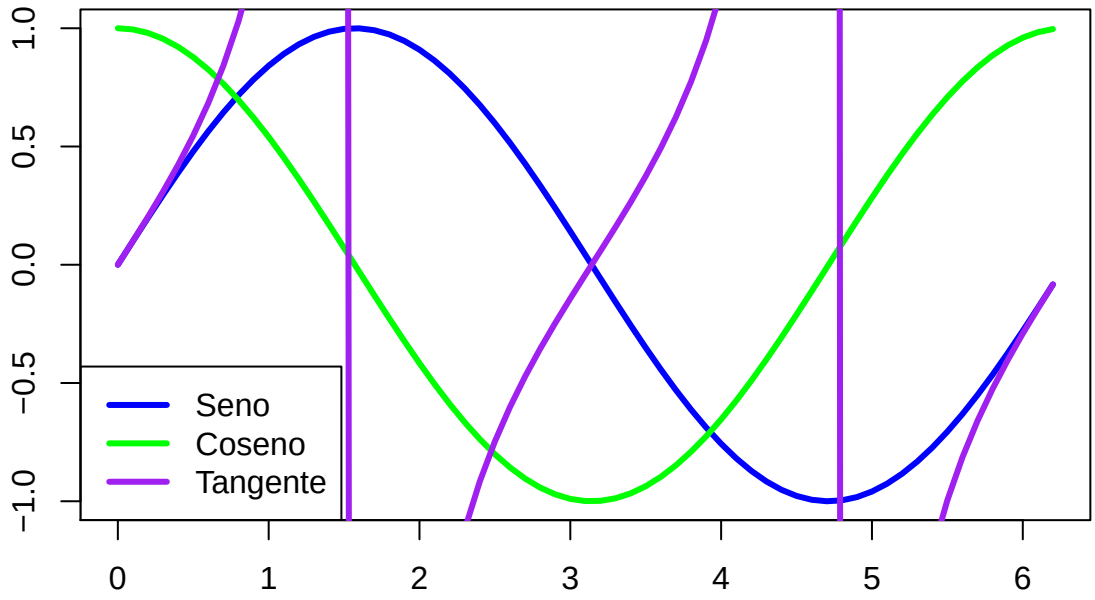
Ejemplo de añadir líneas y curvas

```
x = c(5*(1:20))
plot(x,c(exp(-x)+(-1)^x*x/2*sin(x)^2))
lines(c(20,10,40,80,60,60,20),c(20,0,-20,-20,40,0,20),lwd = 2,col = "darkslategray1")
curve(20*sin(x),add = TRUE,col = "green")
```



Ejemplo principio de curso

```
x = seq(0,2*pi,0.1)
plot(x,sin(x),type = "l",col = "blue",lwd = 3, xlab = "",ylab = "")
lines(x,cos(x),col = "green",lwd = 3)
lines(x,tan(x),col = "purple",lwd = 3)
legend("bottomleft",
       col = c("blue","green","purple"),
       legend=c("Seno","Coseno","Tangente"),
       lwd = 3,
       bty = "l")
```



Ejemplo añadiendo elementos

```
x = c(5*(1:10))
plot(x,c(exp(-x)+(-1)^x*x/2*sin(x)^2),xlab ="",ylab = "",
     main = "Gráfico con varios elementos")
segments(10,0,40,0,col = "red", lwd = 4)
arrows(10,0,40,-10,col = "blue", length = 0.5,angle = 5, code = 3)
symbols(40,0,stars = cbind(1,.5,1,.5,1,.5,1,.5,1,.5),add = TRUE,lwd = 3,inches = 0.5)
symbols(40,0,stars = cbind(1,.5,1,.5,1,.5,1,.5,1,.5),add = TRUE,lwd = 3)
polygon(c(20,30,40),c(10,-10,10),col = "gold",density = 3,angle = 90,lty = 4,lwd = 5)
```

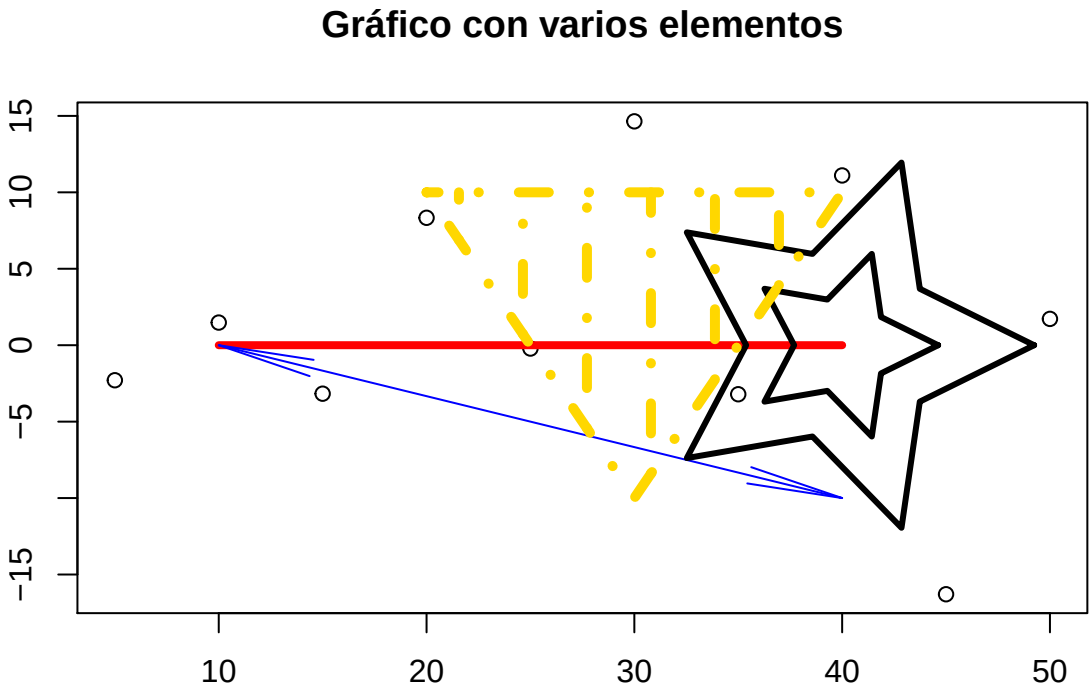


Gráfico con varios elementos
15
10
5
0
−5
−15
10
20
30
40
50