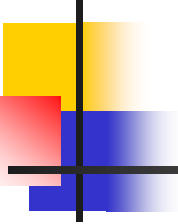




# Vectores, matrices y funciones

---

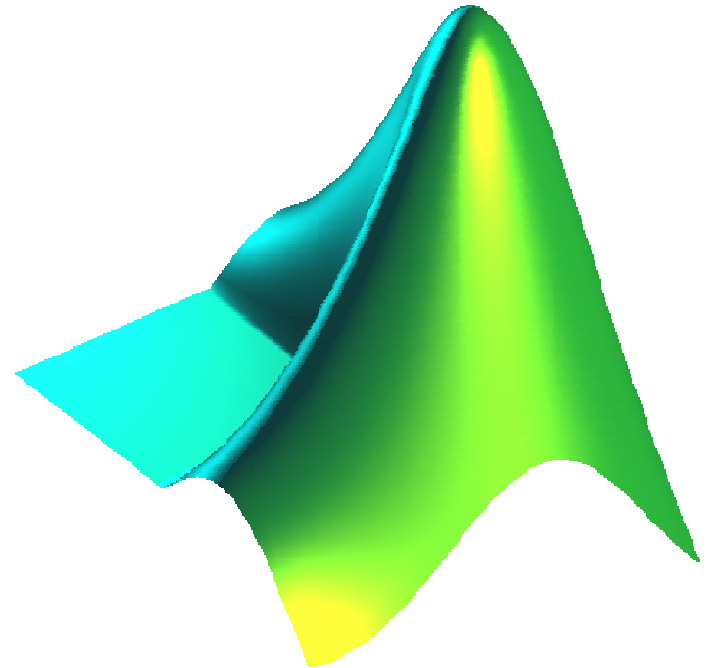
Laboratorio de Matemáticas  
Práctica 1



# Guión

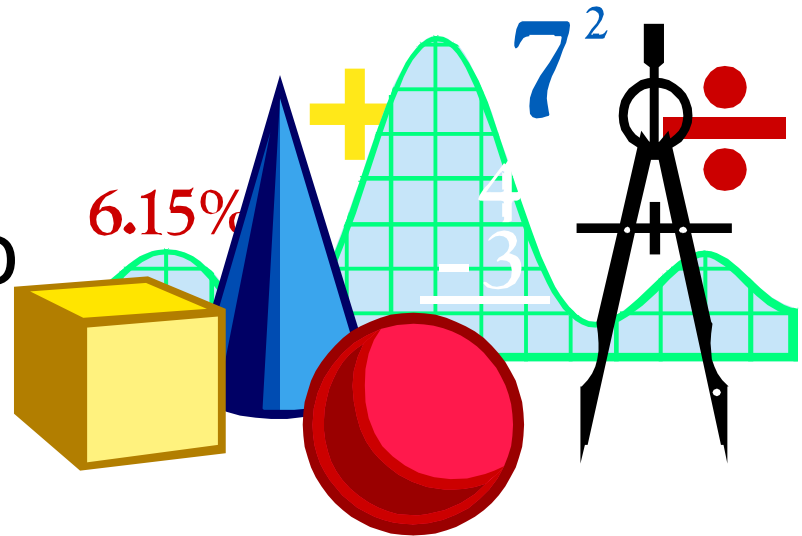
---

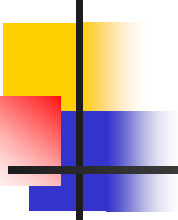
- ¿Por qué MATLAB?
- Mandatos Básicos
- Variables
- Funciones
- Vectores
- Matrices
- Ficheros de función



# ¿Por qué MATLAB?

- Calidad científica
- Potencia
- Flexibilidad
- Facilidad de uso
- Interactividad
- Transparencia
- Gráficos





# Mandatos básicos

---

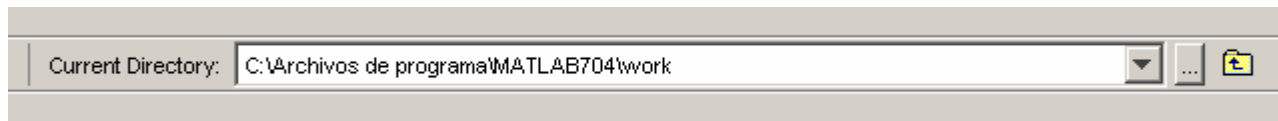
- Ayuda

- » `help`

- » `help clc`

- » `help cos`

- Directorio de trabajo





# Variables

---

- Asignar

- » `a=3, b=4;`

- » `c='cadena';`

- » `a+b; ans`

- Listar

- » `who`

- » `whos`

- Eliminar

- » `clear b`

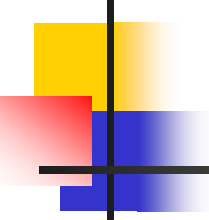


# Operaciones

---

- Suma y resta:  $+$   $-$
- Producto y cociente:  $*$   $/$
- Potencia:  $^$

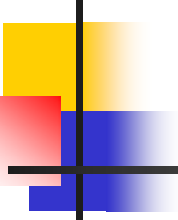
$$1+1=3$$



# Constantes

---

- Número  $\pi$ : **pi**
- Unidad imaginaria: **i, j**
- Precisión: **eps**
- Infinito: **Inf**
- Indeterminación: **NaN**



# Formatos numéricos

---

■ `format compact, pi`

`ans =`  
`3.1416`

■ `format long, pi`

`ans =`  
`3.14159265358979`

■ `format rat, pi`

`ans =`  
`355/113`

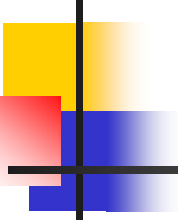
■ `format short, pi`

`ans =`  
`3.1416`

■ `format, pi`

`ans =`  
`3.1416`





# Funciones elementales

---

- `help elfun`

- `sin`

- `cos`

- `tan`

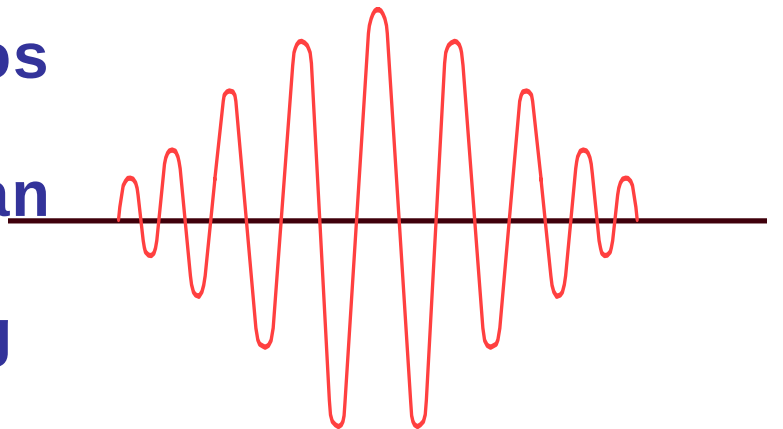
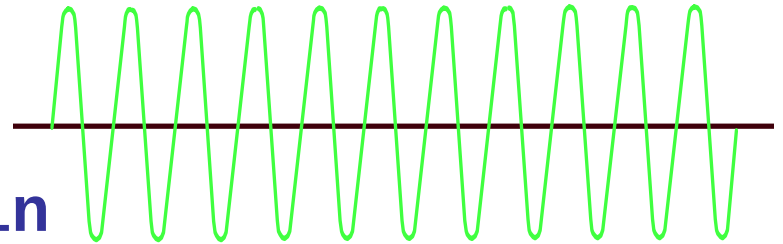
- `exp`

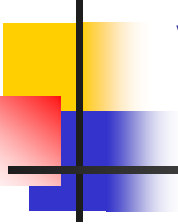
- `asin`

- `acos`

- `atan`

- `log`





# Vectores

---

- Fila

- »  $u = [2, 0, 0, 6]$        $u = [2 \ 0 \ 0 \ 6]$

- Columna

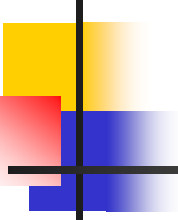
- »  $v = [2; 0; 0; 6]$        $v = [2 \ 0 \ 0 \ 6]'$

- Longitud

- »  $\text{length}(u), \text{length}(v)$

- Tamaño

- »  $\text{size}(u), \text{size}(v)$



# Componentes de un vector

---

- Obtener

- » `v(1)`
- » `v(2)`
- » `v(4)`
- » `v([2 3])`
- » `v([1 4])`
- » `v(2:end)`

- Modificar

- » `v(4) = 7`
- » `v([1 4]) = v([4 1])`
- » `flip1r(v)`

- Concatenar

- » `v = [v v]`

# Vectores progresivos

- Números naturales

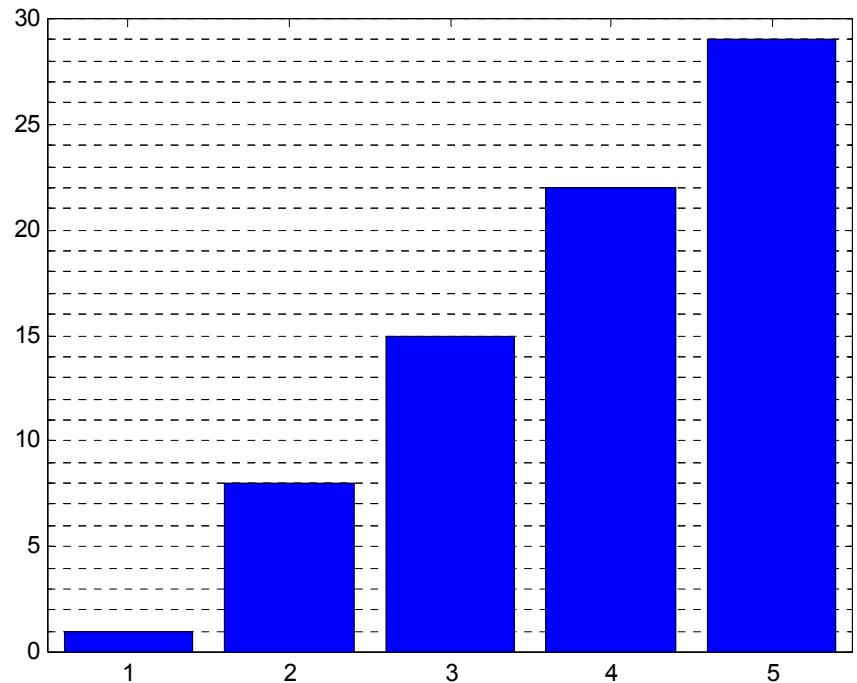
- »  $n = 100$

- »  $x = 1 : n$

- Progresión aritmética

- »  $x = 1 : 7 : 29$

- » `bar(x)`



# Vectores progresivos: gráfica de una función

- Partición de un intervalo

- » `a = 0; b = 2*pi;`

- » `h = (b-a)/n;`

- » `x = a : h : b`

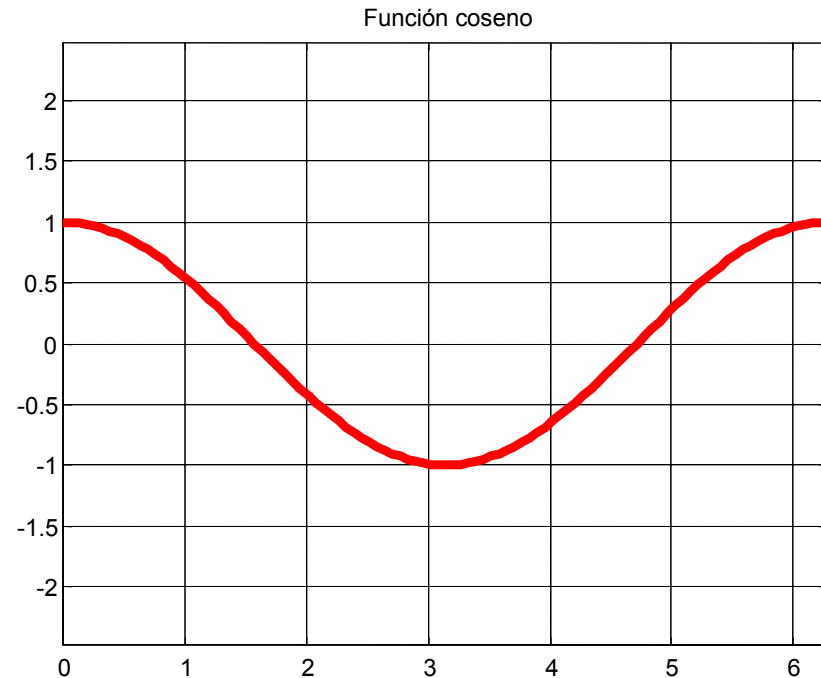
- » `plot(x, cos(x))`

- » `grid`

- » `title('Función coseno')`

- Otra forma equivalente

- » `x = linspace(a,b,n+1)`



# Vectores especiales

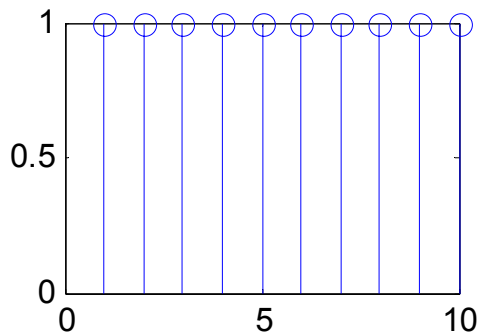
» `ones(1, 10)`

» `zeros(1, 10)`

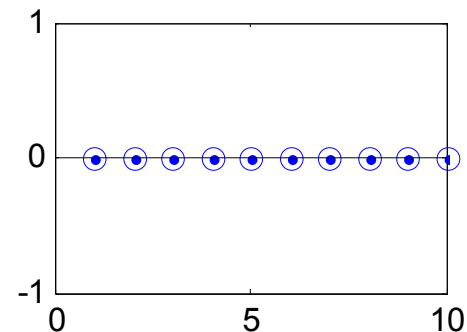
» `rand(1, 10)`

» `randn(1, 10)`

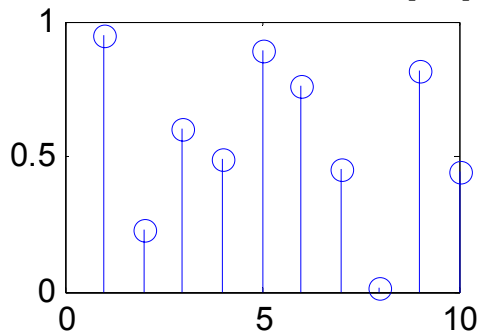
Vector de unos



Vector de ceros



Distribución uniforme en [0,1]



Distribución normal  $N(0,1)$

