```
√4
```

```
2
```

MATRICES

EJERCICIO 1

INTRODUCIR UN TEXTO

```
√2.
```

```
1.41421
```

```
N[√2, 200]
```

```
1.41421356237309504880168872420969807856967187537694807317667973799073
 24784621070388503875343276415727350138462309122970249248360558507372
 12644121497099935831413222665927505592755799950501152782060571 5
```

```
a := 3
```

```
b := 7
```

```
a + b
```

```
10
```

$$A := \begin{pmatrix} -1 & 2 & 0 \\ 1. & 3 & -1 \\ 0 & 1 & 2 \end{pmatrix}$$

$$B := \begin{pmatrix} 0 & 1 & 3 \\ -1 & 4 & 5 \\ 2 & 1 & 3 \end{pmatrix}$$

```
2 A - 5 B
```

```
{{-2, -1, -15}, {7, -14, -27}, {-10, -3, -11}}
```

```
MatrixForm[A.B]
```

$$\begin{pmatrix} -2 & 7 & 7 \\ -5 & 12 & 15 \\ 3 & 6 & 11 \end{pmatrix}$$

```
B.A
```

```
{{1, 6, 5}, {5, 15, 6}, {-1, 10, 5}}
```

```
A.B == B.A
```

```
False
```

```
Det[Inverse[A]]
```

```
-0.0909091
```

```
Inverse[A.B] == Inverse[B].Inverse[A]
```

```
True
```

```
Det[A.B] == Det[A] * Det[B]
```

```
True
```

```
Inverse[5 Transpose[A] - 3 Det[B] A]
```

```
{{-0.0130293, 0.00745425, 0.00293412},
 {0.00435529, 0.00393651, 0.00154948},
 {-0.00171432, -0.00154948, 0.0100284}}
```

EJERCICIO 2

```
Clear[A, B]
```

$$A := \begin{pmatrix} 3 & 2 & -2 \\ 1 & 3 & -1 \\ 1 & 2 & 0 \end{pmatrix}$$

```
Eigenvalues[A]
```

```
{3, 2, 1}
```

La matriz A será diagonalizable

$$B := \begin{pmatrix} 2 & 1 & 0 \\ 0 & 1 & -1 \\ 0 & 2 & 4 \end{pmatrix}$$

```
Eigenvalues[B]
```

```
{3, 2, 2}
```

```
Eigenvectors[B]
```

```
{{-1, -1, 2}, {1, 0, 0}, {0, 0, 0}}
```

La matriz B no es diagonalizable

```
Eigenvectors[A]
```

```
{{1, 1, 1}, {0, 1, 1}, {1, 0, 1}}
```

```
p = Transpose[Eigenvectors[A]]
```

```
{{1, 0, 1}, {1, 1, 0}, {1, 1, 1}}
```

```
d = Inverse[p].A.p
```

```
{{3, 0, 0}, {0, 2, 0}, {0, 0, 1}}
```

```
MatrixForm[d]
```

$$\begin{pmatrix} 3 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

EJERCICIO 3

$$A := \begin{pmatrix} 3 & -2 & 1 \\ 2 & -2 & 2 \\ 1 & -2 & -5 \end{pmatrix}$$

```
Eigenvalues[A]
```

```
{-4, -2, 2}
```

```
Eigenvectors[A]
```

```
{{-1, -2, 3}, {-1, -2, 1}, {2, 1, 0}}
```

```
p = Transpose[Eigenvectors[A]]
```

```
{{-1, -1, 2}, {-2, -2, 1}, {3, 1, 0}}
```

```
d = Inverse[p].A.p
```

```
{{-4, 0, 0}, {0, -2, 0}, {0, 0, 2}}
```

```
MatrixForm[d]
```

$$\begin{pmatrix} -4 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & 2 \end{pmatrix}$$

```
MatrixPower[A, 20]
```

```
{{183252811776, -366503526400, -549755289600},
 {366503526400, -733006004224, -1099510579200},
 {-549755289600, 1099510579200, 1649266917376}}
```

$$\mathbf{p.}\begin{pmatrix} \mathbf{4^{20}} & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \mathbf{-2^{20}} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \mathbf{2^{20}} \end{pmatrix}\mathbf{.Inverse[p]}$$

```
{{183253860352, -366505623552, -549756338176},
 {366505623552, -733010198528, -1099512676352},
 {-549756338176, 1099512676352, 1649267965952}}
```