
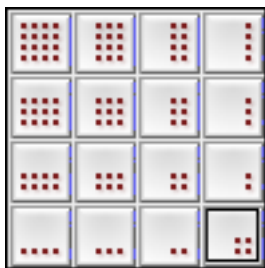


The Matrix

Matrices are used for all kinds of stuff. They are mathematical objects which have an algebra all of their own or you might use them to just group things together...like for plotting points.

You can insert a matrix via the matrix mini-palette behind the matrix button  in the palette.



Select a matrix size.

Here is a 4-by-4 matrix.

$$\square \begin{pmatrix} ? & ? \\ ? & ? \end{pmatrix}$$

A blank matrix will be inserted with question marks in all of the element positions. Use the tab key to move around the matrix. Highlight any of the question marks and start entering in math stuff.

$$\square \begin{pmatrix} 1 & 4 \\ 5 & 2 \end{pmatrix}$$

More Columns

Pressing the comma key on your keyboard will move you to the next column in the matrix. If you are at the right most column then LiveMath will create a new column in the matrix.

$$\square \begin{pmatrix} ? & ? & ? & ? & ? & ? \\ ? & ? & ? & ? & ? & ? \end{pmatrix}$$

More Rows

SHIFT-RETURN will create more rows.

$$\square \begin{pmatrix} ? & ? \\ ? & ? \\ ? & ? \\ ? & ? \\ ? & ? \\ ? & ? \end{pmatrix}$$

Arithmetic

You can type in all of the arithmetic for matrices along with using the palette.

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} = \begin{pmatrix} 2 & 4 \\ 6 & 8 \end{pmatrix}$ Calculate



The transpose button in the palette looks like this:



$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}^t$

$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}^t = \begin{pmatrix} 1 & 3 \\ 2 & 4 \end{pmatrix}$ Calculate

Matrix Element

Elements of a matrix can be identified by their row and column position. Use these as subscripts to obtain their value.

$$A_{(\text{row}, \text{column})}$$

Here is the element in the first row; second column of the matrix A:

$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$

$A_{(1,2)}$

$A_{(1,2)} = 2$ Calculate



Now It's Your Turn... Follow the directions below to get hands on experience.



1.

Calculate

$$\begin{pmatrix} 1 & -1 \\ 0 & 1 \end{pmatrix} + \begin{pmatrix} 1 & -1 \\ 0 & 1 \end{pmatrix}$$



2.

Calculate

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



3.

Calculate

$$\begin{pmatrix} 1 & -1 \\ 0 & 1 \end{pmatrix}^+$$

 4.

Calculate

$$\begin{pmatrix} 1 & -1 \\ 0 & 1 \end{pmatrix}^2$$

 5.

Define

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

assign the variable x to the value in the second row first column.