

# Matrices

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Example one: pmatrix is for parenthesis  
This needs amsmath.

`\begin{math} \end{math}` or `$ $` or `\( \)` are inline math mode.  
`\begin{displaymath} \end{displaymath}` or `$$ $$` or `\[ \]` are display math mode.

Suggestion: Using the `$$...$$` should be avoided, as it may cause problems, particularly with the AMS-LaTeX macros. Furthermore, should a problem occur, the error messages may not be helpful.

$$\begin{pmatrix} a & b \\ c & d \\ e & f \end{pmatrix}$$

Example two:

$$M = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 6 & 7 \end{bmatrix}$$

Example three with fractions:

$$M = \begin{pmatrix} \frac{5}{6} & \frac{1}{6} & 0 \\ \frac{5}{6} & 0 & \frac{1}{6} \\ 0 & \frac{5}{6} & \frac{1}{6} \end{pmatrix}$$

Example four with border:

$$M = \begin{matrix} & \begin{matrix} x & y \end{matrix} \\ \begin{matrix} A \\ B \end{matrix} & \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \end{matrix}$$
$$A_{m,n} = \begin{pmatrix} a_{1,1} & a_{1,2} & \cdots & a_{1,n} \\ a_{2,1} & a_{2,2} & \cdots & a_{2,n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m,1} & a_{m,2} & \cdots & a_{m,n} \end{pmatrix}$$

Example five:  
The given matrix is :

$$A = \begin{pmatrix} 4 & -2 & 1 \\ 3 & 6 & -4 \\ 2 & 1 & 8 \end{pmatrix}$$

The inverse of matrix  $A$  is:

$$A^{-1} = \frac{1}{263} \begin{pmatrix} 52 & 17 & 2 \\ -32 & 30 & 19 \\ -9 & -8 & 30 \end{pmatrix}$$