1

```
\matrix { ⟨line⟩ \cr ... ⟨line⟩ \cr }
\pmatrix { ⟨line⟩ \cr ... ⟨line⟩ \cr }
\bordermatrix { ⟨line⟩ \cr ... ⟨line⟩ \cr }
```

Each of these three commands produces a matrix. The elements of each row of the input matrix are separated by '&' and each row in turn is ended by \cr. (This is the same form that is used for an alignment.) The commands differ in the following ways:

- \matrix produces a matrix without any surrounding or inserted delimiters.
- \pmatrix produces a matrix surrounded by parentheses.
- \bordermatrix produces a matrix in which the first row and the first column are treated as labels. (The first element of the first row is usually left blank.) The rest of the matrix is enclosed in parentheses.

TeX can make the parentheses for \pmatrix and \bordermatrix as large as they need to be by inserting vertical extensions. If you want a matrix to be surrounded by delimiters other than parentheses, you should use \matrix in conjunction with \left and \right (p. '\left').

Example:
```
$$\displaylines{
    \matrix{t_{11}&t_{12}&t_{13}\cr
            t_{21}&t_{22}&t_{23}\cr
            t_{31}&t_{32}&t_{33}\cr}\qquad
\left\{\matrix{t_{11}&t_{12}&t_{13}\cr
            t_{21}&t_{22}&t_{23}\cr
            t_{31}&t_{32}&t_{33}\cr}\right\}\cr
\pmatrix{t_{11}&t_{12}&t_{13}\cr
            t_{21}&t_{22}&t_{23}\cr
            t_{31}&t_{32}&t_{33}\cr}\qquad
\bordermatrix{&c_1&c_2&c_3\cr
            r_1&t_{11}&t_{12}&t_{13}\cr
            r_2&t_{21}&t_{22}&t_{23}\cr
            r_3&t_{31}&t_{32}&t_{33}\cr}\cr}$$
```

produces:

$$
\begin{matrix} t_{11} & t_{12} & t_{13} \\ t_{21} & t_{22} & t_{23} \\ t_{31} & t_{32} & t_{33} \end{matrix} \qquad
\left\{ \begin{matrix} t_{11} & t_{12} & t_{13} \\ t_{21} & t_{22} & t_{23} \\ t_{31} & t_{32} & t_{33} \end{matrix} \right\}
$$

$$
\begin{pmatrix} t_{11} & t_{12} & t_{13} \\ t_{21} & t_{22} & t_{23} \\ t_{31} & t_{32} & t_{33} \end{pmatrix} \qquad
\bordermatrix{ & c_1 & c_2 & c_3 \cr r_1 & t_{11} & t_{12} & t_{13} \cr r_2 & t_{21} & t_{22} & t_{23} \cr r_3 & t_{31} & t_{32} & t_{33}}
$$