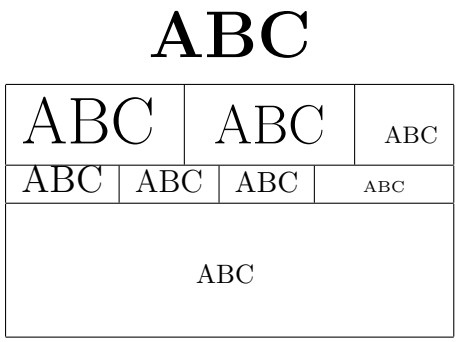
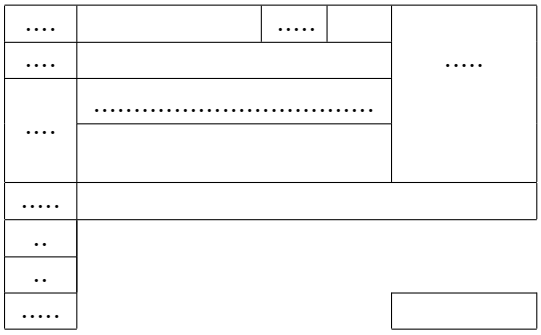
1 Table

1.1 different fontsize



1.2 customized table



1.3 align w.r.t decimal point

quantity	value
u	4.1631111
v	25.83422

2 formula

2.1 arguing

$$\begin{aligned}(x+\mathrm{i}y)(x-\mathrm{i}y) &= x^2+\mathrm{i}xy-\mathrm{i}xy-\mathrm{i}^2y^2\\ &= x^2+y^2\end{aligned}$$

use $\mathrm{i}^2=-1$, we obtain

$$\begin{aligned}(x+\mathrm{i}y)^2 &= x^2+2\mathrm{i}xy-y^2\\ (x-\mathrm{i}y)^2 &= x^2-2\mathrm{i}xy-y^2\end{aligned}$$

$$\begin{aligned}y &= f(x)+g(x) && \text{by (1)}\\ &= -\sin x && \text{since ..}\end{aligned}$$

2.2 $\Longrightarrow$

$$\begin{cases}a=b+c\\ d=bb+cc\end{cases}\Longrightarrow\begin{cases}D=c+f\\ A=aa+bb\end{cases}\Longrightarrow\begin{cases}g=e+q\\ s=a+bb\end{cases}$$

2.3 cases

$$f(x)=\begin{cases}1 & -1<x<1\\ 0 & \text{other x}\end{cases}$$

3 matrix

3.1 inline

for matrix appeared in line, use $\left(\begin{smallmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \end{smallmatrix}\right)$

3.2 different matrix environment

$$\begin{matrix} 1 & 1 \\ 1 & 1 \end{matrix} \quad \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} \quad \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

$$\begin{Bmatrix} 1 & 1 \\ 1 & 1 \end{Bmatrix} \quad \begin{vmatrix} 1 & 1 \\ 1 & 1 \end{vmatrix} \quad \begin{Vmatrix} 1 & 1 \\ 1 & 1 \end{Vmatrix}$$

3.3 ...

$$\begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ & a_{22} & \cdots & a_{2n} \\ 0 & & \ddots & \vdots \\ & & & a_{nn} \end{pmatrix}$$

3.4 gauss

$$\left(\begin{array}{ccc|l} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|l} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|l} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|l} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{array}\right)$$