Contents

Chapter 1

tex笔记

1.1 使用频率较低的符号列表

特殊符号表

```
\begin{center}
 \begin{tabular}{|c|c|c|c|c|}
   \hline
   $\hbar$ & $\imath$ & $\jmath$ & $\ell$ & $\Im$\\
   \hline
   $\wp$ & $\mho$ & $\prime$ & $\Box$ & $\Diamond$\\
   \hline
   $\bot$ & $\top$ & $\surd$ & $\diamondsuit$ & $\heartsuit$\\
   \hline
   $\clubsuit$ & $\spadesuit$ & $\neg$ & $\lnot$ & $\flat$\\
   \hline
   $\natural$ & $\sharp$ & \dag & \ddag & \S\\
   \hline
   \P & \copyright & \pounds & \textregistered & \\
   \hline
 \end{tabular}
\end{center}
```

$\hbar$	$\imath$	$\jmath$	ℓ	$\Im$
$\wp$	$\mho$	$\prime$	$\Box$	$\Diamond$
$\bot$	$\top$	$\surd$	$\diamondsuit$	$\heartsuit$
$\clubsuit$	$\spadesuit$	$\neg$	$\lnot$	$\flat$
$\natural$	$\sharp$	$\dag$	$\ddag$	$\S$
$\P$	$\copyright$	$\pounds$	$\textregistered$	

1.2 itemize enumerate

列表

```
\begin{enumerate}
\item This is an example of \ldots
\item \ldots the usual enumeration.
\begin{enumerate}[a)]
  \item And this is a \ldots
  \item \ldots couple of \ldots
\end{enumerate}
  \item
  \begin{enumerate}[-- i --]
  \item \ldots examples of \ldots
  \item \ldots custom-tailored \ldots
  \item \ldots enumerations.
  \newcounter{enumii_saved}
  \setcounter{enumii_saved}{\value{enumii}}
  \end{enumerate}
  Some general comments
  \begin{enumerate}[-- i --]
  \setcounter{enumii}{\value{enumii_saved}}
  % 如果要换另一个条列式项目，但编号接续，使用\newcounter{enumii_saved}来操作
  \item My next point.
  \setcounter{enumii}{7}
  % 使用setcounter{enumii}{数字}来指定编号号码
  \item My eighth point.
  \end{enumerate}
\end{enumerate}
```

1. This is an example of …
2. … the usual enumeration.
   a) And this is a …
   b) … couple of …
3. – i – … examples of …
   – ii – … custom-tailored …
   – iii – … enumerations.

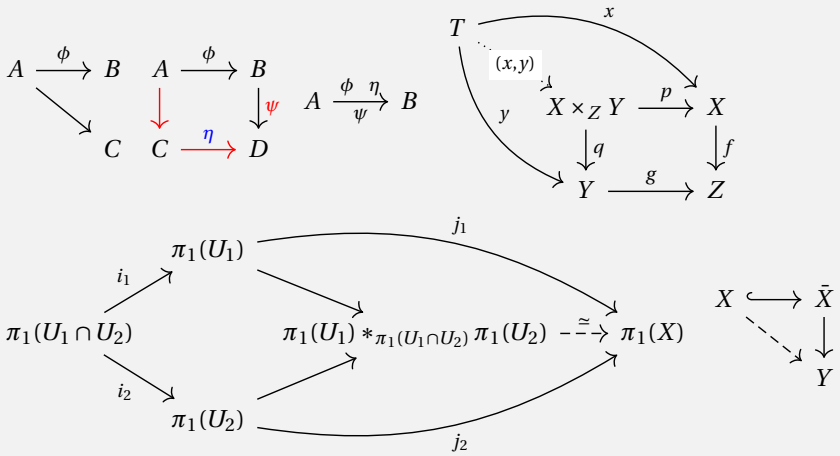
   Some general comments

   – iv – My next point.
   – viii – My eighth point.

1.3 tikz

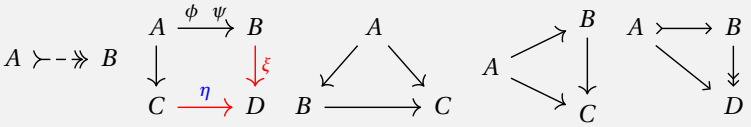
画图

```
\begin{tikzcd}
  A \arrow[rd] \arrow[r, "\phi"] & B \\
  & C
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r, "\phi"] \arrow[d, red]
  & B \arrow[d, "\psi" red] \\
  C \arrow[r, red, "\eta" blue]
  & D
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r, "\phi" near start, "\psi"', "\eta" near end] & B
\end{tikzcd}
\begin{tikzcd}
  T
  \arrow[drr, bend left, "x"]
  \arrow[ddr, bend right, "y"]
  \arrow[dr, dotted, "{(x,y)}" description] & & \\
  & X \times_Z Y \arrow[r, "p"] \arrow[d, "q"]
  & X \arrow[d, "f"] \\
  & Y \arrow[r, "g"]
  & Z
\end{tikzcd}\\
\begin{tikzcd}[column sep=tiny]
  & \pi_1(U_1) \ar[dr] \ar[drr, "j_1", bend left=20]
  &
  &[1.5em] \\
  \pi_1(U_1\cap U_2) \ar[ur, "i_1"] \ar[dr, "i_2"']
  &
  & \pi_1(U_1) \ast_{ \pi_1(U_1\cap U_2)} \pi_1(U_2) \ar[r, dashed, "\simeq"]
  & \pi_1(X) \\
  & \pi_1(U_2) \ar[ur]\ar[urr, "j_2"', bend right=20]
  &
  &
\end{tikzcd}
\begin{tikzcd}
  X \arrow[r, hook] \arrow[dr, dashrightarrow]
  & \bar{X} \arrow[d]\\
  & Y
\end{tikzcd}
```



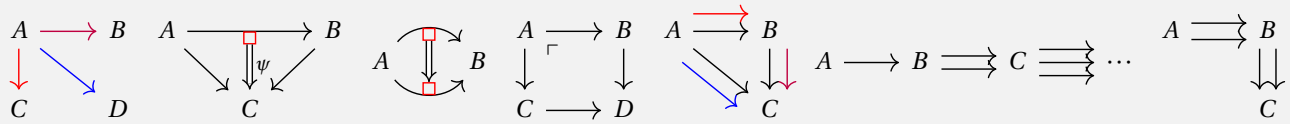
画图

```
\begin{tikzcd}
  A \arrow[r, tail, two heads, dashed] & B
\end{tikzcd}
\begin{tikzcd}
  A \arrow{d} \arrow{r}[near start]{\phi}[near end]{\psi}
  & B \arrow[red]{d}{\xi} \\
  C \arrow[red]{r}[blue]{\eta}
  & D
\end{tikzcd}
\begin{tikzcd}[column sep=small]
          & A \arrow[dl] \arrow[dr] & \\
  B \arrow{rr} &
                & C
\end{tikzcd}
\begin{tikzcd}[row sep=tiny]
  & B \arrow[dd] \\
  A \arrow[ur] \arrow[dr] &
  \\
  & C
\end{tikzcd}
% in preamble
\tikzcdset{
  arrow style=tikz,
  diagrams={>={Straight Barb[scale=0.8]}}
}
% in document body
\begin{tikzcd}
  A \arrow[r, tail] \arrow[rd] & B \arrow[d, two heads]\\
  & D
\end{tikzcd}
```



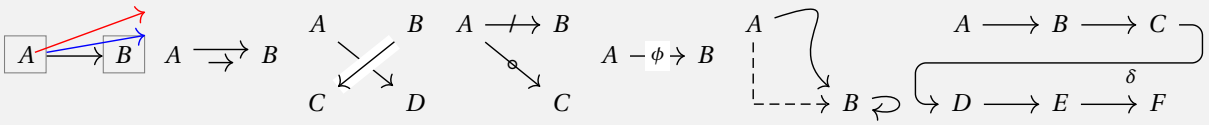
画图

```
\begin{tikzcd}
  A \arrow[to=Z, red] \arrow[to=2-2, blue]
  & B \\
  |[alias=Z]| C
  & D
  \arrow[from=ul, to=1-2, purple]
\end{tikzcd}
\begin{tikzcd}[column sep=scriptsize]
  A \arrow[dr] \arrow[rr, ""{name=U, below, draw=red}]{}
  & & B \arrow[dl] \\
  & C \arrow[Rightarrow, from=U, "\psi"]
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r, bend left=50, ""{name=U, below, draw=red}]
  \arrow[r, bend right=50, ""{name=D, draw=red}]
  & B
  \arrow[Rightarrow, from=U, to=D]
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r] \arrow[d] \arrow[dr, phantom, "\ulcorner", very near start]
  & B \arrow[d] \\
  C \arrow[r]
  & D
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r, red, shift left=1.5ex] \arrow[r]
  \arrow[dr, blue, shift right=1.5ex] \arrow[dr]
  & B \arrow[d, purple, shift left=1.5ex] \arrow[d]\\
  & C
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r]
  & B \arrow[r, shift left]
  \arrow[r, shift right]
  & C \arrow[r]
  \arrow[r, shift left=2]
  \arrow[r, shift right=2]
  & \cdots
\end{tikzcd}
\begin{tikzcd}
  A \arrow[r, yshift=0.7ex] \arrow[r, yshift=-0.7ex]
  & B \arrow[d, xshift=0.7ex] \arrow[d, xshift=-0.7ex] \\
  & C
\end{tikzcd}
```



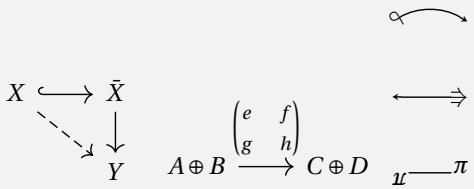
画图

```
  \begin{tikzcd}[cells={nodes={draw=gray}}]
    A \arrow[r, black]
\arrow[r, blue, end anchor=north east]
      \arrow[r,
red, start anchor={[xshift=-1ex]},
end anchor={[yshift=2ex]north east}]
    & B
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[r, shift left]
\ar[r, shorten=2mm, shift right]
    & B
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[dr] & B \arrow[dl, crossing over] \\
    C
  & D
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[r, "/" marking]
\arrow[rd, "\circ" marking]
    & B \\
    & C
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[r, "\phi" description] & B
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[dr, controls={+(1.5,0.5) and +(-1,0.8)}]
    \arrow[dr, dashed, to path=|- (\tikztotarget)]
    & \\
    & B \arrow[loop right]
  \end{tikzcd}
  \begin{tikzcd}
    A \arrow[r]
& B \arrow[r]
    \arrow[d, phantom, ""{coordinate, name=Z}]
    & C \arrow[dll,
"\delta",
    rounded corners,
    to path={ -- ([xshift=2ex]\tikztostart.east)
      |- (Z) [near end]\tikztonodes
      -| ([xshift=-2ex]\tikztotarget.west)
      -- (\tikztotarget)}] \\
    D \arrow[r]
& E \arrow[r]
  & F
  \end{tikzcd}
```



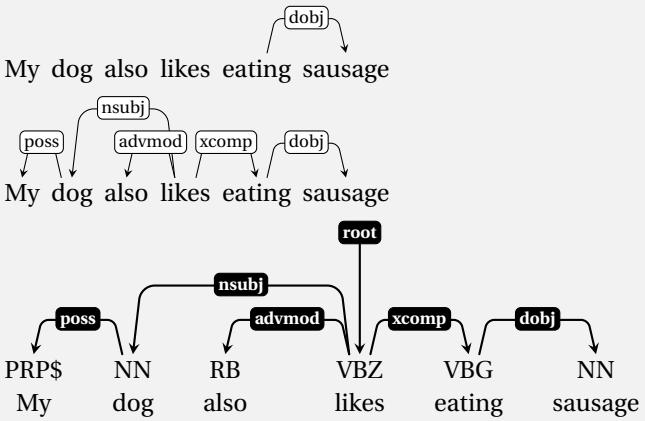
画图

```
\begin{tikzpicture}[commutative diagrams/every diagram]
  \matrix[matrix of math nodes, name=m, commutative diagrams/every cell] {
    X & \bar X \\
    & Y
    \\};
  \path[commutative diagrams/.cd, every arrow, every label]
  (m-1-1) edge[commutative diagrams/hook] (m-1-2)
  edge[commutative diagrams/dashed] (m-2-2)
  (m-1-2) edge (m-2-2);
\end{tikzpicture}
\begin{tikzcd}[ampersand replacement=\&]
  A \oplus B \ar[r, "{\begin{pmatrix} e & f \\ g & h \end{pmatrix}}"]
  \& C \oplus D
\end{tikzcd}
\tikzset{
  math to/.tip={Glyph[glyph math command=rightarrow]},
  loop/.tip={Glyph[glyph math command=looparrowleft, swap]},
  weird/.tip={Glyph[glyph math command=Rrightarrow, glyph length=1.5ex]},
  pi/.tip={Glyph[glyph math command=pi, glyph length=1.5ex, glyph axis=0pt]},
}
\begin{tikzpicture}[line width=rule_thickness]
  \draw[loop-math to, bend left] (0,2) to (1,2);
  \draw[math to-weird] (0,1) to (1,1);
  \draw[pi-pi] (0,0) to (1,0);
\end{tikzpicture}
```



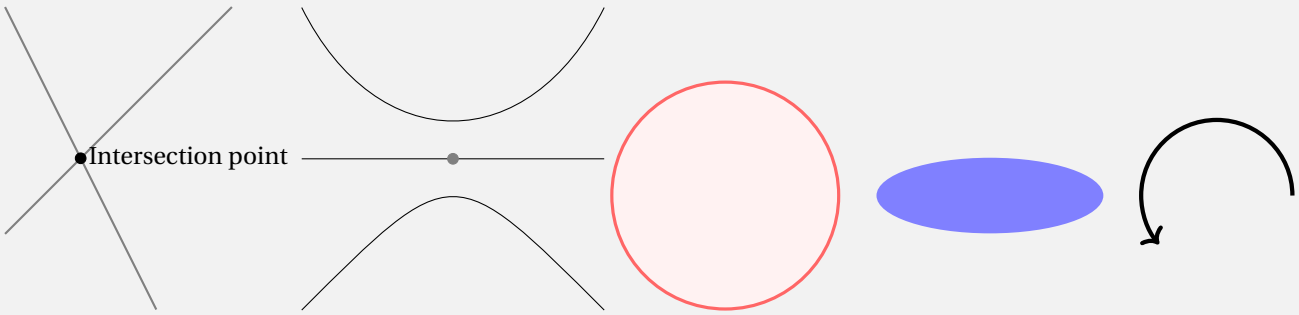
画图

```
\begin{dependency}
  \begin{deptext}
    My \& dog \& also \& likes \& eating \& sausage \\
  \end{deptext}
  \depedge{5}{6}{dobj}
\end{dependency}\\
\begin{dependency}
  \begin{deptext}
    My \& dog \& also \& likes \& eating \& sausage \\
  \end{deptext}
  \depedge{2}{1}{poss}
  \depedge{4}{2}{nsubj}
  \depedge{4}{3}{advmod}
  \depedge{4}{5}{xcomp}
  \depedge{5}{6}{dobj}
\end{dependency}\\
\begin{dependency}[theme=night]
  \begin{deptext}[column sep=.5cm, row sep=.1ex]
    PRP\$ \& NN \& RB \&[.5cm] VBZ \& VBG \& NN \\
    My \& dog \& also \& likes \& eating \& sausage \\
  \end{deptext}
  \deproot{4}{root}
  \depedge{2}{1}{poss}
  \depedge{4}{2}{nsubj}
  \depedge{4}{3}{advmod}
  \depedge{4}{5}{xcomp}
  \depedge{5}{6}{dobj}
\end{dependency}
```



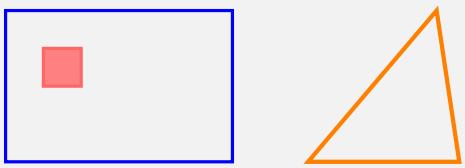
画图

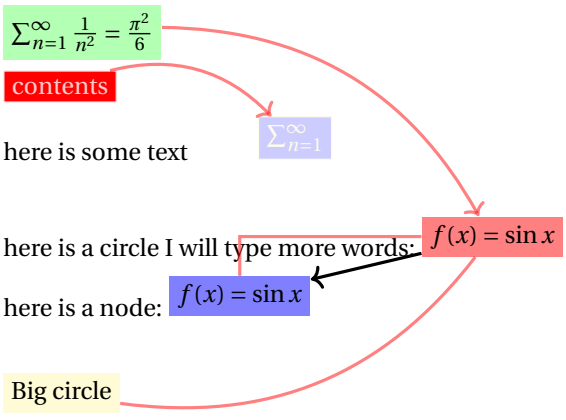
```
\begin{tikzpicture}
 \draw[gray, thick] (-1,2) -- (1,-2);
 \draw[gray, thick] (-1,-1) -- (2,2);
 \filldraw[black] (0,0) circle (2pt) node[anchor=west] {Intersection point};
\end{tikzpicture}
\begin{tikzpicture}
  \draw (-2,0) -- (2,0);
  \filldraw [gray] (0,0) circle (2pt);
  \draw (-2,-2) .. controls (0,0) .. (2,-2);
  \draw (-2,2) .. controls (-1,0) and (1,0) .. (2,2);
\end{tikzpicture}
\begin{tikzpicture}
  \filldraw[color=red!60, fill=red!5, very thick](-1,0) circle (1.5);
  \fill[blue!50] (2.5,0) ellipse (1.5 and 0.5);
  \draw[ultra thick, ->] (6.5,0) arc (0:220:1);
\end{tikzpicture}
```



画图

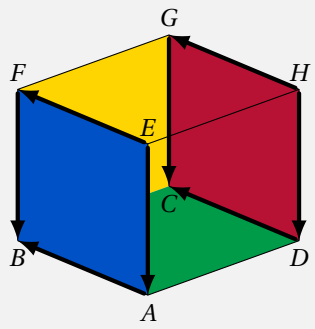
```
\begin{tikzpicture}
  \filldraw[color=red!60, fill=red!50, very thick](1,1) rectangle (0.5,1.5);
  \draw[blue, very thick] (0,0)rectangle (3,2);
  \draw[orange, ultra thick] (4,0) -- (6,0) -- (5.7,2) -- cycle;
\end{tikzpicture}
```





270226

```
\definecolor{myred}{RGB}{183,18,52}
\definecolor{myyellow}{RGB}{254,213,1}
\definecolor{myblue}{RGB}{0,80,198}
\definecolor{mygreen}{RGB}{0,155,72}
\begin{tikzpicture}[
  line join=round,
  y={(-0.86cm,0.36cm)},x={(1cm,0.36cm)}, z={(0cm,1cm)},
  arr/.style={-latex,ultra thick,line cap=round,shorten <= 1.5pt}
]
\def\Side{2}
\coordinate (A1) at (0,0,0);
\coordinate (A2) at (0,\Side,0);
\coordinate (A3) at (\Side,\Side,0);
\coordinate (A4) at (\Side,0,0);
\coordinate (B1) at (0,0,\Side);
\coordinate (B2) at (0,\Side,\Side);
\coordinate (B3) at (\Side,\Side,\Side);
\coordinate (B4) at (\Side,0,\Side);

\fill[myyellow] (A2) -- (A3) -- (B3) -- (B2) -- cycle;
\fill[mygreen]  (A2) -- (A3) -- (A4) -- (A1) -- cycle;
\fill[myred](A3) -- (B3) -- (B4) -- (A4) -- cycle;
\fill[myblue]   (A1) -- (A2) -- (B2) -- (B1) -- cycle;

\draw (A2) -- (A1) -- (A4);
\draw (B2) -- (B1) -- (B4) -- (B3) -- cycle;
\draw (A1) -- (B1);
\draw (A2) -- (B2);
\draw (A4) -- (B4);

\draw[thin] (A3) -- (B3);
\draw[thin] (A3) -- (A4);

\path[arr]
  (A1) edge (A2)
  (B2) edge (A2)
  (B1) edge (B2)
  (B1) edge (A1)
  (B4) edge (A4)
  (B3) edge (A3)
  (B4) edge (B3)
  (A4) edge (A3);

\node[below] at (A1) {$A$};
\node[below] at (A2) {$B$};
\node[below] at (A3) {$C$};
\node[below] at (A4) {$D$};
\node[above] at (B1) {$E$};
\node[above] at (B2) {$F$};
\node[above] at (B3) {$G$};
\node[above] at (B4) {$H$};
\end{tikzpicture}
```



根据三点画弧

```
\begin{tikzpicture}
  \tkzDefPoint(1,2){A}
  \tkzDefPoint(3,4){B}
  \tkzDefPoint(2,4){C}
  \tkzCircumCenter(A,B,C)\tkzGetPoint{O}
  \tkzDrawArc(O,C)(A)
\end{tikzpicture}
```

字体

```
$\mathscr{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$\\
$\mathbb{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$\\
$\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$\\
$\mathfrak{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
```

$\mathscr{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\mathbb{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\mathfrak{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$

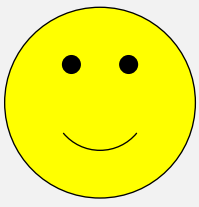
1.4 pstricks

this is black. this is darkgray. this is gray. this is lightgray.
this is red. this is green. this is blue. this is cyan. this is magenta. this is yellow.

1.5 asymptote

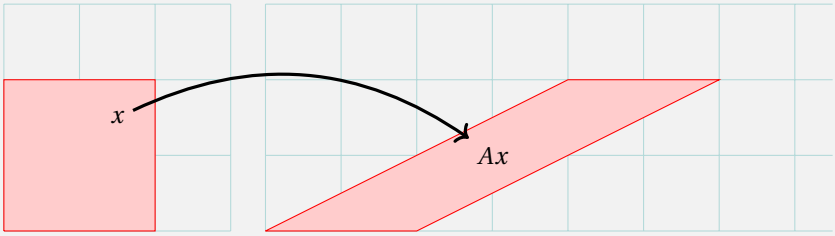
Asymptote

```
\begin{asy}
  include graph;
  size(1inch);
  filldraw(circle((0,0),1),yellow,black);
  fill(circle((-.3,.4),.1),black);
  fill(circle((.3,.4),.1),black);
  draw(arc((0,0),.5,-140,-40));
\end{asy}
```



Transform

```
\begin{center}
  \begin{tikzpicture}[remember picture]
    \draw[help lines] (0,0) grid (3,3);
    \draw[red,fill=red!20] (0,0)--(2,0)--(2,2)--(0,2)--(0,0);
    \node (n3) at (1.5,1.5) {$x$};
  \end{tikzpicture}
  \hspace{3mm}
  \begin{tikzpicture}[remember picture]
    \draw[help lines] (0,0) grid (7.5,3);
    \draw[red,fill=red!20] (0,0)--(2,0)--(6,2)--(4,2)--(0,0);
    \node (n2) at (3,1) {$Ax$};
  \end{tikzpicture}
  \begin{tikzpicture}[remember picture,overlay]
    \draw[overlay,->,very thick] (n3) to[bend left] (n2);
  \end{tikzpicture}
\end{center}
```



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[TH] Holder不等式及其应用; 田景峰, 哈明虎, 清华大学.

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