

## Color

- 5 `\newgray{color}{num}`
- 5 `\newrgbcolor{color}{num1 num2 num3}`
- 5 `\newhsbcolor{color}{num1 num2 num3}`
- 5 `\newcmykcolor{color}{num1 num2 num3 num4}`

## Setting graphics parameters

- 6 `\psset{par1=value1,par2=value2,...}`

## Dimensions, coordinates and angles

- 7 `unit=dim` Default: 1cm
- 7 `\pssetlength{cmd}{dim}`
- 7 `\psaddtolength{cmd}{dim}`
- 7 `xunit=dim` Default: 1cm
- 7 `yunit=dim` Default: 1cm
- 7 `runit=dim` Default: 1cm
- 8 `\degrees[num]`
- 8 `\radians`

## Basic graphics parameters

- 8 `linewidth=dim` Default: .8pt
- 8 `linecolor=color` Default: black
- 9 `showpoints=true/false` Default: false

## Lines and polygons

- 10 `linearc=dim` Default: 0pt
- 10 `framearc=num` Default: 0
- 10 `cornersize=relative/absolute` Default: relative
- 10 `\psline*[par]{arrows}(x0,y0)(x1,y1)...(xn,yn)`
- 10 `\qline(coor0)(coor1)`
- 11 `\pspolygon*[par](x0,y0)(x1,y1)(x2,y2)...(xn,yn)`
- 11 `\psframe*[par](x0,y0)(x1,y1)`

## Arcs, circles and ellipses

- 11 `\pscicle*[par](x0,y0){radius}`
- 11 `\qdisk(coor){radius}`
- 12 `\pswedge*[par](x0,y0){radius}{angle1}{angle2}`
- 12 `\psellipse*[par](x0,y0)(x1,y1)`
- 12 `\psarc*[par]{arrows}(x,y){radius}{angleA}{angleB}`
- 12 `arcsepA=dim` Default: 0pt
- 12 `arcsepB=dim` Default: 0pt
- 13 `arcsep=dim` Default: 0
- 13 `\psarcn*[par]{arrows}(x,y){radius}{angleA}{angleB}`

## Curves

- 13 `\psbezier*[par]{arrows}(x0,y0)(x1,y1)(x2,y2)(x3,y3)`
- 14 `\parabola*[par]{arrows}(x0,y0)(x1,y1)`
- 14 `curvature=num1 num2 num3` Default: 1 .1 0

- 15 `\pscurve*[par]{arrows}(x1,y1)...(xn,yn)`
- 15 `\psecurve*[par]{arrows}(x1,y1)...(xn,yn)`
- 15 `\psccurve*[par]{arrows}(x1,y1)...(xn,yn)`

### Dots

- 15 `\psdots*[par](x1,y1)(x2,y2)...(xn,yn)`
- 16 `dotstyle=style` Default: \*

#### Dot styles

| Style     | Example   | Style     | Example   |
|-----------|-----------|-----------|-----------|
| *         | • • • • • | square    | ◻ ◻ ◻ ◻ ◻ |
| o         | ◦ ◦ ◦ ◦ ◦ | square*   | ◻ ◻ ◻ ◻ ◻ |
| +         | + + + + + | pentagon  | ◊ ◊ ◊ ◊ ◊ |
| triangle  | ▲ ▲ ▲ ▲ ▲ | pentagon* | ◊ ◊ ◊ ◊ ◊ |
| triangle* | ▲ ▲ ▲ ▲ ▲ |           |           |

- 16 `dotscale=num1 num2` Default: 1
- 16 `dotangle=angle` Default: 0

### Grids

- 17 `\psgrid(x0,y0)(x1,y1)(x2,y2)`
- 18 `gridwidth=dim` Default: .8pt
- 18 `gridcolor=color` Default: black
- 18 `griddots=num` Default: 0
- 18 `gridlabels=dim` Default: 10pt

- 18 `gridlabelcolor=color` Default: black
- 18 `subgriddiv=int` Default: 5
- 18 `subgridwidth=dim` Default: .4pt
- 18 `subgridcolor=color` Default: gray
- 18 `subgriddots=num` Default: 0

### Plots

- 19 `plotstyle=style` Default: line
- 20 `\fileplot*[par]{file}`
- 20 `\dataplot*[par]{commands}`
- 20 `\savedata{command}[data]`
- 20 `\readdata{command}{file}`
- 21 `\listplot*[par]{list}`
- 21 `\psplot*[par]{xmin}{xmax}{function}`
- 22 `\parametricplot*[par]{tmin}{tmax}{function}`
- 22 `plotpoints=int` Default: 50

### Coordinate systems

- 24 `origin={coor}` Default: 0pt,0pt
- 24 `swapaxes=true` Default: false

### Line styles

- 24 `linestyle=style` Default: solid
- 25 `dash=dim1 dim2` Default: 5pt 3pt

|    |                                       |                                  |
|----|---------------------------------------|----------------------------------|
| 25 | <code>dotsep=dim</code>               | <b>Default: 3pt</b>              |
| 25 | <code>border=dim</code>               | <b>Default: 0pt</b>              |
| 25 | <code>bordercolor=color</code>        | <b>Default: white</b>            |
| 25 | <code>doubleline=true/false</code>    | <b>Default: false</b>            |
| 25 | <code>doublesep=dim</code>            | <b>Default: 1.25\pslinewidth</b> |
| 26 | <code>doublecolor=color</code>        | <b>Default: white</b>            |
| 26 | <code>shadow=true/false</code>        | <b>Default: false</b>            |
| 26 | <code>shadowsize=dim</code>           | <b>Default: 3pt</b>              |
| 26 | <code>shadowangle=angle</code>        | <b>Default: -45</b>              |
| 26 | <code>shadowcolor=color</code>        | <b>Default: darkgray</b>         |
| 26 | <code>dimen=outer/inner/middle</code> | <b>Default: outer</b>            |



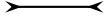













**Fill styles**

|    |                               |                       |
|----|-------------------------------|-----------------------|
| 27 | <code>fillstyle=style</code>  | <b>Default: none</b>  |
| 27 | <code>fillcolor=color</code>  | <b>Default: white</b> |
| 27 | <code>hatchwidth=dim</code>   | <b>Default: .8pt</b>  |
| 27 | <code>hatchsep=dim</code>     | <b>Default: 4pt</b>   |
| 27 | <code>hatchcolor=color</code> | <b>Default: black</b> |
| 27 | <code>hatchangle=rot</code>   | <b>Default: 45</b>    |

**Arrowheads and such**

|    |                           |                   |
|----|---------------------------|-------------------|
| 28 | <code>arrows=style</code> | <b>Default: -</b> |
|----|---------------------------|-------------------|

**Arrows**

| <i>Value</i> | <i>Example</i>  | <i>Name</i>                     |                          |
|--------------|---|---------------------------------|--------------------------|
| -            |    | None                            |                          |
| <->          |    | Arrowheads.                     |                          |
| >-<          |    | Reverse arrowheads.             |                          |
| <<->>        |    | Double arrowheads.              |                          |
| >>-<<        |    | Double reverse arrowheads.      |                          |
| -            |    | T-bars, flush to endpoints.     |                          |
| * *          |    | T-bars, centered on endpoints.  |                          |
| [-]          |    | Square brackets.                |                          |
| (-)          |    | Rounded brackets.               |                          |
| o-o          |    | Circles, centered on endpoints. |                          |
| *_*          |    | Disks, centered on endpoints.   |                          |
| oo-oo        |    | Circles, flush to endpoints.    |                          |
| **_**        |    | Disks, flush to endpoints.      |                          |
| c-c          |    | Extended, rounded ends.         |                          |
| cc-cc        |    | Flush round ends.               |                          |
| C-C          |  | Extended, square ends.          |                          |
| 30           | <code>arrowsize=dim num</code>  |                                 | <b>Default: 2pt 3</b>    |
| 30           | <code>arrowlength=num</code>  |                                 | <b>Default: 1.4</b>      |
| 30           | <code>arrowinset=num</code>   |                                 | <b>Default: .4</b>       |
| 30           | <code>tbar size=dim num</code>  |                                 | <b>Default: 2pt 5</b>    |
| 30           | <code>bracketlength=num</code>  |                                 | <b>Default: .15</b>      |
| 30           | <code>rbracketlength=num</code>   |                                 | <b>Default: .15</b>      |
| 30           | <code>dotsize=dim num</code>  |                                 | <b>Default: .5pt 2.5</b> |
| 30           | <code>arrowscale=arrowscale=num1 num2</code>  |                                 | <b>Default: 1</b>        |

## Custom styles

- 31 `\newpsobject{name}{object}{par1=value1,...}`  
 31 `\newpsstyle{name}{par1=value1,...}`

## The basics

- 32 `\pscustom*[par]{commands}`

## Parameters

- 33 `linetype=int` Default: 0

## Graphics objects

- 35 `liftpen=0/1/2` Default: 0

## Safe tricks

- 36 `\newpath`  
 36 `\moveto(coord)`  
 36 `\closepath`  
 36 `\stroke[par]`  
 37 `\fill[par]`  
 37 `\gsave`  
 37 `\grestore`  
 38 `\translate(coord)`  
 38 `\scale{num1 num2}`

- 38 `\rotate{angle}`  
 38 `\swapaxes`  
 38 `\msave`  
 38 `\mrestore`  
 38 `\openshadow[par]`  
 38 `\closedshadow[par]`  
 38 `\movepath(coord)`

## Pretty safe tricks

- 39 `\lineto(coord)`  
 39 `\rlineto(coord)`  
 39 `\curveto(x1,y1)(x2,y2)(x3,y3)`  
 39 `\rcurveto(x1,y1)(x2,y2)(x3,y3)`

## For hackers only

- 39 `\code{code}`  
 39 `\dim{dim}`  
 39 `\coord(x1,y1)(x2,y2)...(xn,yn)`  
 40 `\rcoord(x1,y1)(x2,y2)...(xn,yn)`  
 40 `\file{file}`  
 40 `\arrows{arrows}`  
 40 `\setcolor{color}`

## Pictures

- 41 `\pspicture*[baseline](x0,y0)(x1,y1)`

41 `\endpspicture`

### Placing and rotating whatever

43 `\rput*[refpoint]{rotation}(x,y){stuff}`

44 `\uput*{labelsep}[refangle]{rotation}(x,y){stuff}`

44 `\pslabelsep`

44 `labelsep=dim` Default: 5pt

### Repetition

46 `\multirput*[refpoint]{angle}(x0,y0)(x1,y1){int}{stuff}`

46 `\multips{angle}(x0,y0)(x1,y1){int}{graphics}`

### Axes

48 `\psaxes*[par]{arrows}(x0,y0)(x1,y1)(x2,y2)`

**Axes label parameters**

| <i>Horitontal</i> | <i>Vertical</i> | <i>Dflt</i> | <i>Description</i> |
|-------------------|-----------------|-------------|--------------------|
| <b>Ox=num</b>     | <b>Oy=num</b>   | 0           | Label at origin.   |
| <b>Dx=num</b>     | <b>Dy=num</b>   | 1           | Label increment.   |
| <b>dx=dim</b>     | <b>oy=dim</b>   | Opt         | Dist btwn labels.  |

50 `labels=all/x/y/none` Default: all

50 `showorigin=true/false` Default: true

50 `ticks=all/x/y/none` Default: all

50 `tickstyle=full/top/bottom` Default: full

50 `ticksize=dim` Default: 3pt

51 `\psxlabel`

51 `\psylabel`

51 `axesstyle=axes/frame/none` Default: axes

### Framed boxes

52 `framesep=dim` Default: 3pt

52 `boxsep=true/false` Default: true

52 `\psframebox*[par]{stuff}`

53 `\psdblframebox*[par]{stuff}`

53 `\psshadowbox*[par]{stuff}`

53 `\pscircularbox*[par]{stuff}`

53 `\cput*[par]{angle}(x,y){stuff}`

54 `\psovalbox*[par]{stuff}`

### Clipping

54 `\clipbox[dim]{stuff}`

54 `\psclip{graphics} ... \endpsclip`

### Rotation and scaling boxes

55 `\rotateleft{stuff}`

55 `\rotateright{stuff}`

56 `\rotatedown{stuff}`

56 `\scalebox{num1 num2}{stuff}`

56 `\scaleboxto(x, y){stuff}`

## Nodes

59 `\node[refpoint]{name}{stuff}`

59 `\Rnode(x, y){name}{stuff}`

59 `\RnodeRef`

60 `\pnode(x, y){name}`

60 `\cnode*[par](x, y){radius}{name}`

60 `\circnode*[par]{name}{stuff}`

60 `\cnodeput*[par]{angle}(x, y){name}{stuff}`

60 `\ovalnode*[par]{name}{stuff}`

## Node connections

61 `nodesep=dim` Default: 0

61 `offset=dim` Default: 0

61 `arm=dim` Default: 10pt

61 `angle=angle` Default: 0

61 `arcangle=angle` Default: 8

61 `ncurv=num` Default: .67

62 `loopsize=dim` Default: 1cm

62 `\incline*[par]{arrows}{nodeA}{nodeB}`

62 `\incLine*[par]{arrows}{nodeA}{nodeB}`

62 `\nccurve*[par]{arrows}{nodeA}{nodeB}`

63 `\ncarc*[par]{arrows}{nodeA}{nodeB}`

63 `\ncbar*[par]{arrows}{nodeA}{nodeB}`

63 `\ncdiag*[par]{arrows}{nodeA}{nodeB}`

64 `\ncdiagg*[par]{arrows}{nodeA}{nodeB}`

64 `\ncangle*[par]{arrows}{nodeA}{nodeB}`

64 `\ncangles*[par]{arrows}{nodeA}{nodeB}`

65 `\ncloop*[par]{arrows}{nodeA}{nodeB}`

65 `\nccircle*[par]{arrows}{node}{radius}`

65 `\pcline*[par]{arrows}(x1, y1)(x2, y2)`

65 `\pccurve*[par]{arrows}(x1, y1)(x2, y2)`

65 `\pcarc*[par]{arrows}(x1, y1)(x2, y2)`

65 `\pcbar*[par]{arrows}(x1, y1)(x2, y2)`

65 `\pcdiag*[par]{arrows}(x1, y1)(x2, y2)`

66 `\pcangle*[par]{arrows}(x1, y1)(x2, y2)`

66 `\pcloop*[par]{arrows}(x1, y1)(x2, y2)`

## Attaching labels to node connections

67 `\lput*[refpoint]{rotation}(pos){stuff}`

68 `\aput*[labelsep]{angle}(pos){stuff}`

68 `\bput*[labelsep]{angle}(pos){stuff}`

68 `\mput*[refpoint]{stuff}`

68 `\Aput*[labelsep]{stuff}`

68 `\Bput*[labelsep]{stuff}`

## Coils and zigzags

70 `\pscoil*[par]{arrows}(x0, y0)(x1, y1)`

- 70 `\psCoil*[par]{angle1}{angle2}`
- 70 `\pszigzag*[par]{arrows}(x0,y0)(x1,y1)`
- 70 `coilwidth=dim` Default: 1cm
- 70 `coilheight=num` Default: 1
- 70 `coilarm=dim` Default: .5cm
- 70 `coilaspect=angle` Default: 45
- 70 `coilinc=angle` Default: 10
- 71 `\nccoil*[par]{arrows}{nodeA}{nodeB}`
- 71 `\nczigzag*[par]{arrows}{nodeA}{nodeB}`
- 71 `\pccoil*[par]{arrows}(x1,y1)(x2,y2)`
- 71 `\pczigzag*[par]{arrows}(x1,y1)(x2,y2)`

| <i>Coordinate</i> | <i>Example</i> | <i>Description</i>        |
|-------------------|----------------|---------------------------|
| $(x,y)$           | (3,4)          | Cartesian coordinate.     |
| $(r;a)$           | (3;110)        | Polar coordinate.         |
| $(node)$          | (A)            | Center of <i>node</i> .   |
| $([par]node)$     | ([angle=45]A)  | Relative to <i>node</i> . |
| $(!ps)$           | !5 3.3 2 exp   | Raw PostScript.           |
| $(coord1 coord2)$ | (A 1in;30)     | Combination.              |

| <i>Angle</i> | <i>Example</i> | <i>Description</i>   |
|--------------|----------------|----------------------|
| <i>num</i>   | 45             | Angle.               |
| $(coord)$    | (-1,1)         | Coordinate (vector). |
| $!ps$        | !33 sqrt       | Raw PostScript.      |

73 `\NormalCoor`

## Special coordinates

72 `\SpecialCoor`

### Special coordinates and angles

## Overlays

- 73 `\overlaybox stuff\endoverlaybox`
- 73 `\psoverlay{string}`
- 74 `\putoverlaybox{string}`
- 74 `gradbegin=color` Default: gradbegin
- 74 `gradend=color` Default: gradend
- 75 `gradlines=int` Default: 500
- 75 `gradmidpoint=num` Default: .9
- 75 `gradangle=angle` Default: 0

## Typesetting text along a path

76 `\pstextpath[pos](x,y){graphics object}{text}`

## Stroking and filling character paths

- 77 `\pscharpath*[par]{text}`
- 78 `\pscharclip*[par]{text} ... \endpscharclip`

## Exporting EPS files

- 79 `\TeXtoEPS`
- 79 `\endTeXtoEPS`
- 80 `\PSTtoEPS[par]{file}{graphics objects}`
- 80 `bblx=dim` Default: -1pt
- 80 `bblly=dim` Default: -1pt
- 80 `bburx=dim` Default: 1pt
- 80 `bbury=dim` Default: 1pt
- 81 `headerfile=file` Default: s
- 81 `headers=none/all/user` Default: none

## Boxes

- 83 `\psmathboxtrue`
- 83 `\psmathboxfalse`
- 83 `\everypsbox{commands}`
- 83 `\pslongbox{name}{cmd}`
- 84 `\psverbboxtrue`
- 84 `\psverbboxfalse`

## Tips and More Tricks

- 85 `\PSTricksOff`

## Including PostScript code

- 87 `\pslbrace`
- 87 `\psrbrace`