PSTricks

pst-platon

A PSTricks package for drawing platonic solids; v.0.01

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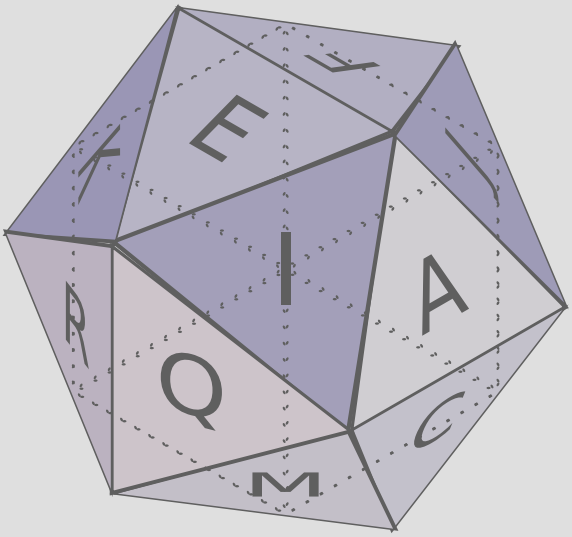

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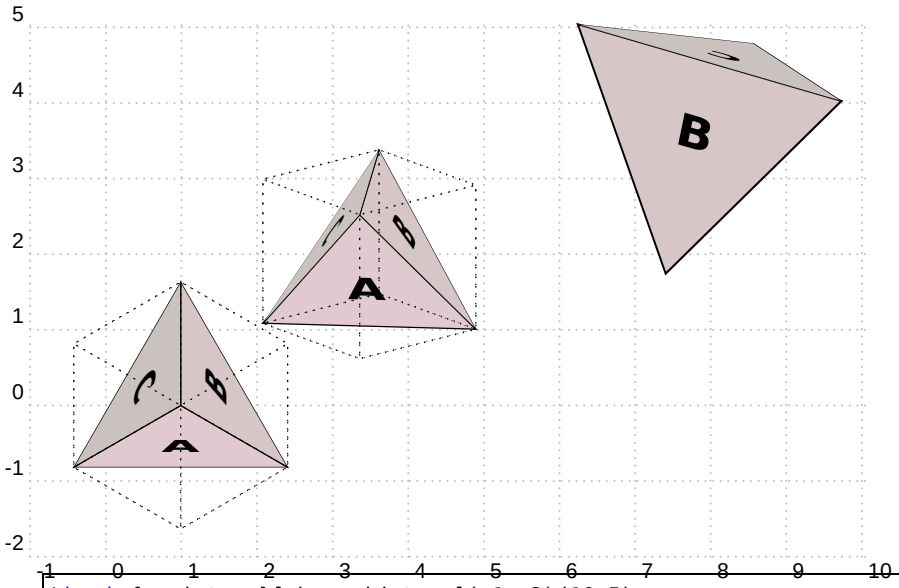
A platonic solid is a convex polyhedron that is a regular polygon. The faces of a platonic solid are congruent regular polygons, with the same number of faces meeting at each vertex. All edges are congruent, as are its vertices and angles. There exists five platonic solids.

Contents

1 The optional Arguments

1.1 PstPicture

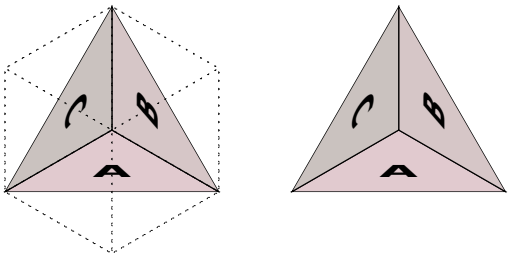
With PstPicture=true (default) the image is set into a pspicture environment, which reserves some space. The correct bounding box depends to the viewpoint. With setting of PstPicture=false you can set the image inside your own pspicture environment with other coordinates. All solids areplaced relative to the origin of the coordinate system. Use \rput to place the platonic solid elsewhere.




```
\begin{pspicture}[showgrid=true](-1,-2)(10,5)
\psTetrahedron[PstPicture=false]
\rput(2,2){\psTetrahedron[PstPicture=false,Viewpoint=1 1.2 0.5]}
\psset{unit=1.3}
\rput(5,3){\psTetrahedron[PstPicture=false,Frame=false,Viewpoint=-1 0.5 2]}
\end{pspicture}
```

1.2 Frame

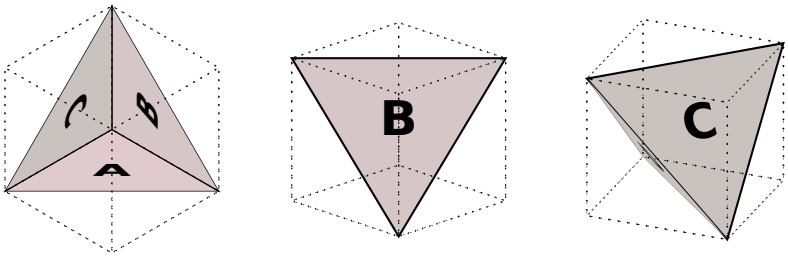
With Frame=true (default) the unique cube with a=1 is printed with dotted lines.




```
\psTetrahedron
\psTetrahedron[Frame=false]
```

1.3 Viewpoint

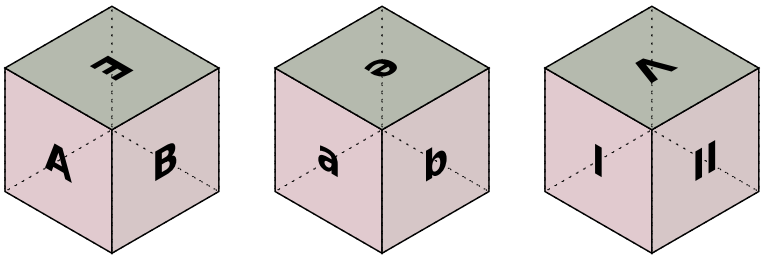
With `Viewpoint` the three dimensional view point from which the solid is seen can be set. The default is `1 1 1`.




```
\psTetrahedron
\psTetrahedron[Viewpoint=-1 1 .5]
\psTetrahedron[Viewpoint=0.4 -1 .5]
```

1.4 faceName

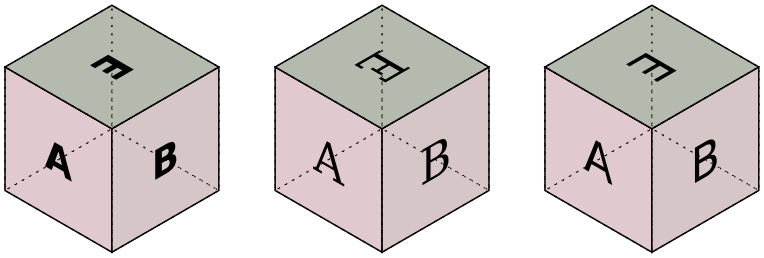
With `faceName` the name of the faces can be set with setting it to one of the macros `\Alph` (default), `\alph`, `\arabic`, `\Roman`, and `\roman`.




```
\psHexahedron%
\psHexahedron[faceName=\alph]%
\psHexahedron[faceName=\Roman]
```

1.5 faceNameFont

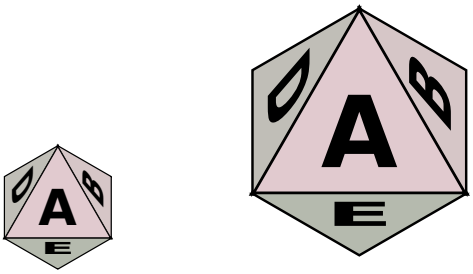
With `faceNameFont` the font for the face name can be set. Any valid LaTeX command is possible.




```
\psHexahedron%
\psHexahedron[faceNameFont=\Huge]%
\psHexahedron[faceNameFont=\Huge\
    sffamily]
```

1.6 psscale

The solids can be magnified by the keyword `psscale` which is preset to 1.



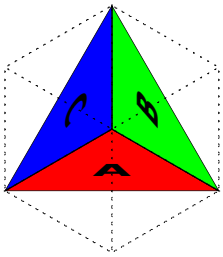

```
\psOctahedron[Frame=false]
\psOctahedron[Frame=false,psscale=2]
```

1.7 Colors

The faces are defined by the colors of type A or B with

```
\newcommand\colorTypeA{%
\definecolor{ColorA}{cmyk}{0.1,0.1,0.05,0}
\definecolor{ColorB}{cmyk}{0.15,0.15,0.05,0}
...
}
\newcommand\colorTypeB{%
\definecolor{ColorA}{cmyk}{0.1,0.2,0.1,0}
\definecolor{ColorB}{cmyk}{0.15,0.2,0.15,0}
...
}
```

New types can be definied in the same way and then set by the keyword `colorType=`⟨*type*⟩.

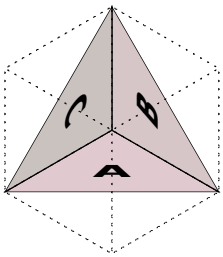



```
\newcommand\colorTypeC{%
  \colorlet{ColorA}{red}
  \colorlet{ColorB}{green}
  \colorlet{ColorC}{blue}
  \definecolor{ColorD}{rgb}{0.55,0.2,0.15}
}
\psTetrahedron[colorType=C]
```

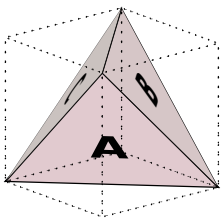
2 The Platonic Solids

There are the five platonic solids with the macronames `\psTetrahedron`, `\psHexahedron`, `\psOctahedron`, `\psDodecahedron`, and `\psIcosahedron`.

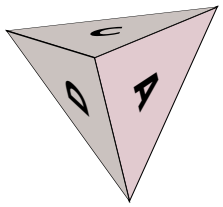
2.1 Tetrahedron



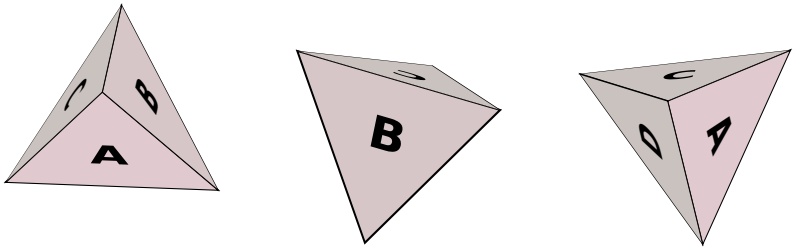

```
\psTetrahedron
```




```
\psTetrahedron[Viewpoint=1 1.2 0.5]
```

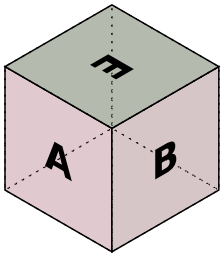



```
\psTetrahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

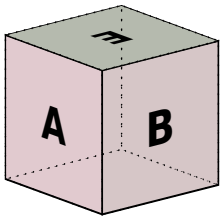



```
\psTetrahedron[Frame=false,Viewpoint=1 1.2 0.7]
\psTetrahedron[Frame=false,Viewpoint=-1 0.5 2]
\psTetrahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

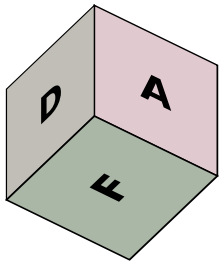
2.2 Hexahedron



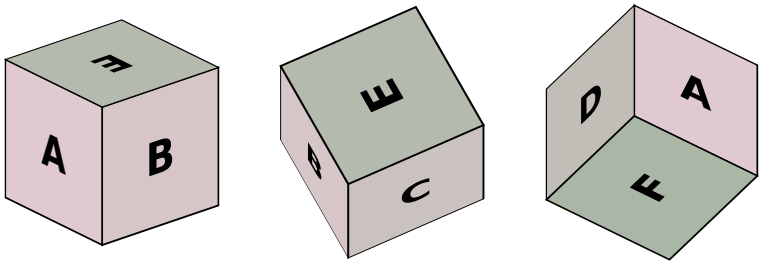

```
\psHexahedron
```




```
\psHexahedron[Viewpoint=1 1.2 0.5]
```

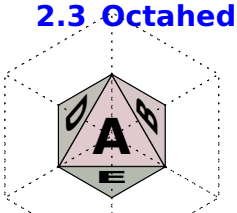



```
\psHexahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

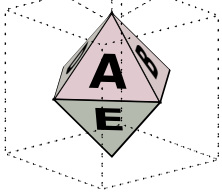



```
\psHexahedron[Frame=false,Viewpoint=1 1.2 0.7]
\psHexahedron[Frame=false,Viewpoint=-1 0.5 2]
\psHexahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

2.3 Octahedron

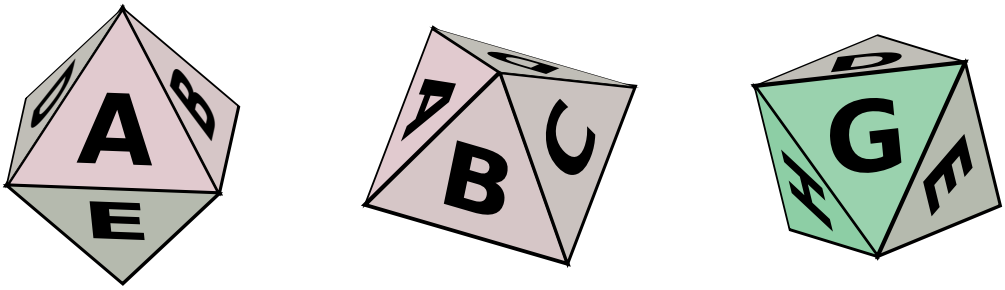



```
\psOctahedron
```



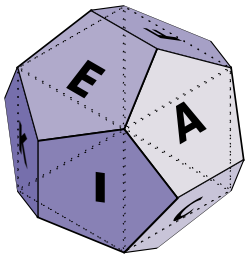

```
\psOctahedron[Viewpoint=1 1.2 0.5]
```


```
\psOctahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

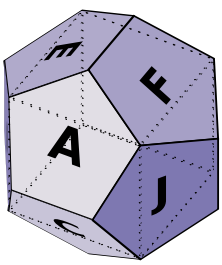


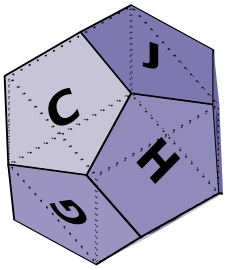

```
\psset{psscale=2}
\psOctahedron[Frame=false,Viewpoint=1 1.2 0.7]
\psOctahedron[Frame=false,Viewpoint=-1 0.5 2]
\psOctahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
```

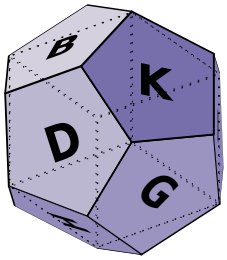
2.4 Dodecahedron



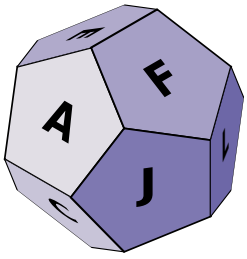

```
\psDodecahedron
```

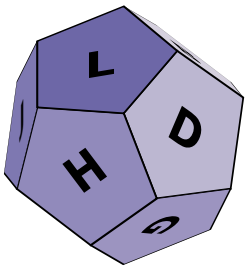


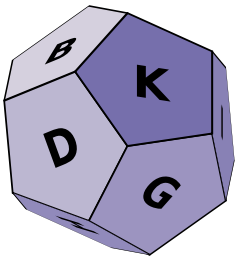





```
\psDodecahedron[Viewpoint=-0.5 0.9 0.9]
\psDodecahedron[Viewpoint=-0.5 0.7 -1.2]
\psDodecahedron[Viewpoint=0.5 -0.7 -0.5]
```

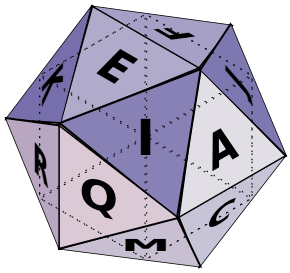




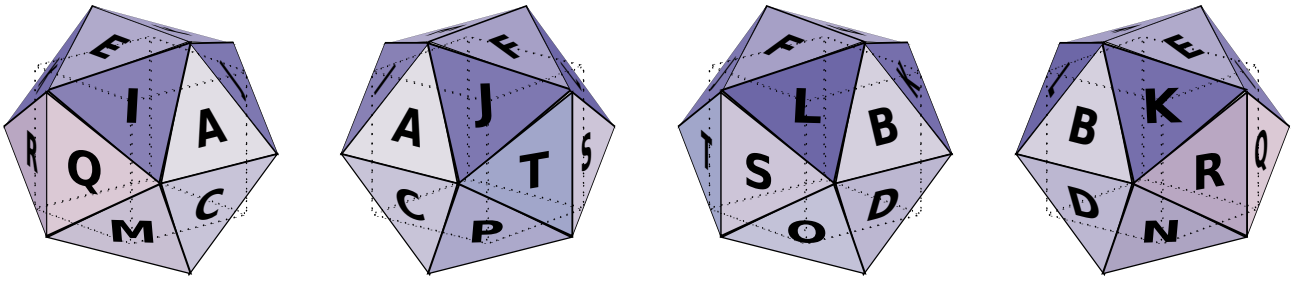



```
\psDodecahedron[Frame=false,Viewpoint=-0.2 0.2 0.2]
\psDodecahedron[Frame=false,Viewpoint=-0.707 -0.707 -1]
\psDodecahedron[Frame=false,Viewpoint=0.6 -0.7 -0.5]
```

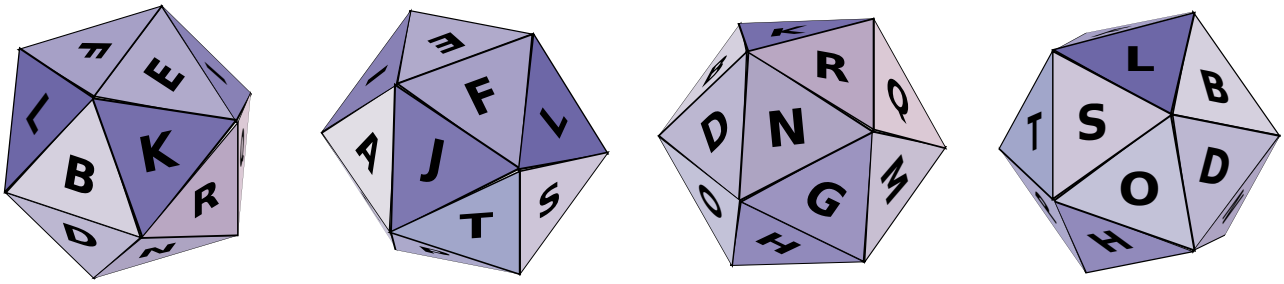
2.5 Isocahedron




```
\psIcosahedron
```



```
\psIcosahedron[Viewpoint=1 1.2 0.5]
\psIcosahedron[Viewpoint=-1 1.2 0.5]
\psIcosahedron[Viewpoint=-1 -1.2 0.5]
\psIcosahedron[Viewpoint=1 -1.2 0.5]
```



```
\psIcosahedron[Frame=false,Viewpoint=0.5 -1 1]
\psIcosahedron[Frame=false,Viewpoint=-1 0.5 1.2]
\psIcosahedron[Frame=false,Viewpoint=0.7 -0.5 -0.8]
\psIcosahedron[Frame=false,Viewpoint=-0.7 -0.7 -0.2]
```

3 List of all optional arguments for pst-platon

Key	Type	Default
PstPicture	boolean	true
Frame	boolean	true
Viewpoint	ordinary	1 1 1
faceName	ordinary	\Alph
faceNameFont	ordinary	\huge \sffamily \bfseries
colorType	ordinary	A

References

[1] Hendri Adriaens. xkeyval package. CTAN:/macros/latex/contrib/xkeyval, 2004.

[2] Denis Girou. Présentation de PSTricks. *Cahier GUTenberg*, 16:21–70, April 1994.

[3] Michel Goosens, Frank Mittelbach, Sebastian Rahtz, Denis Roegel, and Herbert Voß. *The LaTeX Graphics Companion*. Addison-Wesley Publishing Company, Reading, Mass., 2007.

[4] Alan Hoenig. *TEX Unbound: LATEX & TEX Strategies, Fonts, Graphics, and More*. Oxford University Press, London, 1998.

[5] Laura E. Jackson and Herbert Voß. Die plot-funktionen von `pst-plot`. *Die TEXnische Komödie*, 2/02:27–34, June 2002.

[6] Nikolai G. Kollock. *PostScript richtig eingesetzt: vom Konzept zum praktischen Einsatz*. IWT, Vaterstetten, 1989.

[7] Frank Mittelbach and Michel Goosens et al. *The LATEX Companion*. Addison-Wesley Publishing Company, Boston, second edition, 2004.

[8] Frank Mittelbach and Michel Goosens et al. *Der LATEX Begleiter*. Pearson Education, München, zweite edition, 2005.

[9] Herbert Voß. *Chaos und Fraktale selbst programmieren: von Mandelbrotmengen über Farbmanipulationen zur perfekten Darstellung*. Franzis Verlag, Poing, 1994.

[10] Herbert Voß. Die mathematischen Funktionen von PostScript. *Die TEXnische Komödie*, 1/02, March 2002.

[11] Herbert Voß. *`PSTricks` Grafik für TEX und LATEX*. DANTE – Lob.media, Heidelberg/Hamburg, fifth edition, 2008.

[12] Herbert Voß. *Mathematiksatz in LATEX*. Lehmanns Media/DANTE, Berlin/Heidelberg, first edition, 2009.

[13] Timothy Van Zandt. *PSTricks - `PostScript` macros for generic TEX*. http://www.tug.org/application/PSTricks, 1993.

[14] Timothy Van Zandt. *`multido.tex` - a loop macro, that supports fixed-point addition*. CTAN:/graphics/pstricks/generic/multido.tex, 1997.

[15] Timothy Van Zandt. *`pst-plot`: Plotting two dimensional functions and data*. CTAN:graphics/pstricks/generic/pst-plot.tex, 1999.

[16] Timothy Van Zandt and Denis Girou. Inside PSTricks. *TUGboat*, 15:239–246, September 1994.

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