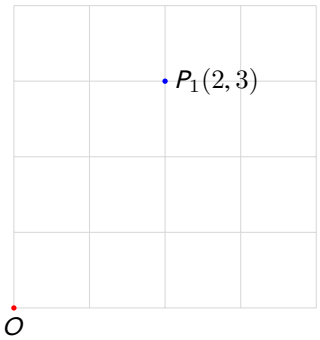
tkz-euclide examples

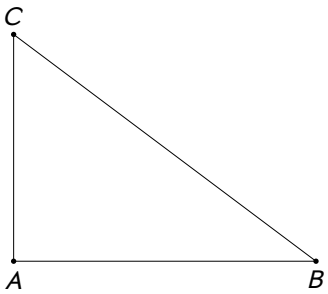
1 Points

1.1 Fixed Points

1.1.1 Cartesian Coordinates: `(x, y)`

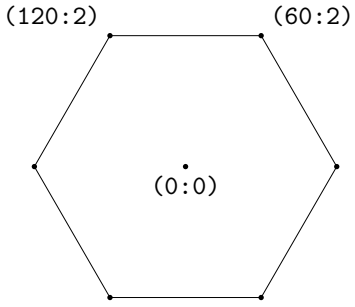



```
\begin{tikzpicture}
  \tkzInit[xmax=4,ymax=4]
  \tkzGrid[color=gray!30]
  \tkzDefPoint(0,0){O}
  \tkzDrawPoint[red](O)
  \tkzDefPoint(2,3){P1}
  \tkzDrawPoint[blue](P1)
  \tkzLabelPoint[right](P1){$P_1(2,3)$}
  \tkzLabelPoints[below](O)
\end{tikzpicture}
```



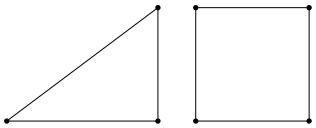

```
\begin{tikzpicture}
  \tkzDefPoint(0,0){A}
  \tkzDefPoint(4,0){B}
  \tkzDefPoint(0,3){C}
  \tkzDrawPolygon(A,B,C)
  \tkzDrawPoints(A,B,C)
  \tkzLabelPoints[below](A,B)
  \tkzLabelPoints[above](C)
\end{tikzpicture}
```

1.1.2 Polar Coordinates: `(degree:radius)`



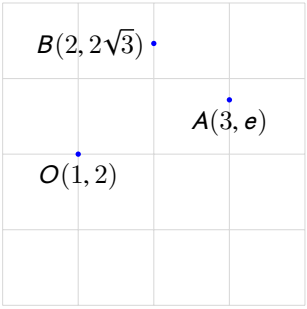

```
\begin{tikzpicture}
  \tkzDefPoint(0:0){O}
  \tkzDefPoint(60:2){A_1}  \tkzDefPoint(120:2){A_2}
  \tkzDefPoint(180:2){A_3} \tkzDefPoint(240:2){A_4}
  \tkzDefPoint(300:2){A_5} \tkzDefPoint(360:2){A_6}
  \tkzDrawPolygon(A_1,A_...,A_6)
  \tkzDrawPoints(A_1,A_...,A_6,O)
  \tkzLabelPoint[above right](A_1){\texttt{(60:2)}}
  \tkzLabelPoint[above left](A_2){\texttt{(120:2)}}
  \tkzLabelPoint[below](O){\texttt{(0:0)}}
\end{tikzpicture}
```

1.1.3 Multiple Points: `\tkzDefPoints`



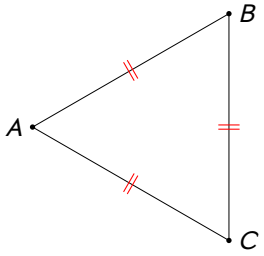
```
\begin{tikzpicture}[scale=1]
  \tkzDefPoints{0/0/A,2/0/B,2/1.5/C}
  \tkzDrawPolygon(A,B,C)
  \tkzDrawPoints(A,B,C)
  \tkzDefPoints{2.5/0/A,4/0/B,4/1.5/C,2.5/1.5/D}
  \tkzDrawPolygon(A,...,D)
  \tkzDrawPoints(A,B,C,D)
\end{tikzpicture}
```

1.2 Calculations: `xfp`



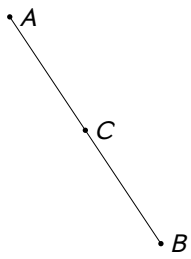

```
\begin{tikzpicture}
  \tkzInit[xmax=4,ymax=4] \tkzGrid[color=gray!30]
  \tkzDefPoint(-1+2,sqrt(4)){O}
  \tkzDefPoint({3*ln(exp(1))},{exp(1)}){A}
  \tkzDefPoint({4*sin(pi/6)},{4*cos(pi/6)}){B}
  \tkzDrawPoints[color=blue](O,B,A)
  \tkzLabelPoint[below](O){$O(1,2)$}
  \tkzLabelPoint[below](A){$A(3,e)$}
  \tkzLabelPoint[left](B){$B(2,2\sqrt{3})$}
\end{tikzpicture}
```

1.3 Point relative to another: `\tkzDefShiftPoint`



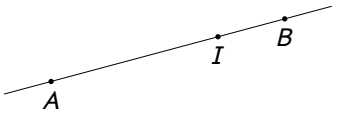

```
\begin{tikzpicture}[scale=1]
  \tkzDefPoint(2,3){A}
  \tkzDefShiftPoint[A](30:3){B}
  \tkzDefShiftPoint[A]({3/2*sqrt(3)},-1.5){C}
  \tkzDrawPolygon(A,B,C)
  \tkzDrawPoints(A,B,C)
  \tkzLabelPoints[right](B,C)
  \tkzLabelPoints[left](A)
  \tkzMarkSegments[mark=||,color=red](A,B A,C B,C)
\end{tikzpicture}
```

1.4 Midpoint: `\tkzDefMidPoint`



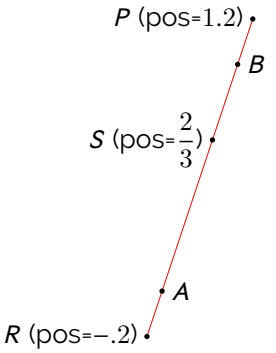

```
\begin{tikzpicture}[scale=1]
  \tkzDefPoint(2,3){A}
  \tkzDefPoint(4,0){B}
  \tkzDefMidPoint(A,B) \tkzGetPoint{C}
  \tkzDrawSegment(A,B)
  \tkzDrawPoints(A,B,C)
  \tkzLabelPoints[right](A,B,C)
\end{tikzpicture}
```

1.5 Barycentre: `\tkzDefBarycentricPoint`



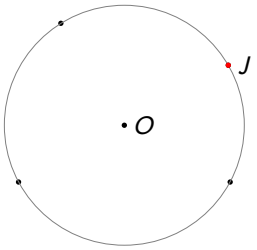

```
\begin{tikzpicture}
  \tkzDefPoint(1,1.5){A}
  \tkzDefShiftPointCoord[1,1.5](15:3.2){B}
  \tkzDefBarycentricPoint(A=2,B=5)
  \tkzGetPoint{I}
  \tkzDrawPoints(A,B,I) \tkzDrawLine(A,B)
  \tkzLabelPoints(A,B,I)
\end{tikzpicture}
```

1.6 Point On A Line: `\tkzDefPointOnLine`




```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,1/3/B}
  \tkzDrawLine[red](A,B)
  \tkzDefPointOnLine[pos=1.2](A,B)  \tkzGetPoint{P}
  \tkzDefPointOnLine[pos=-0.2](A,B) \tkzGetPoint{R}
  \tkzDefPointOnLine[pos=2/3](A,B)  \tkzGetPoint{S}
  \tkzLabelPoints[right](A,B)
  \tkzLabelPoint[left](P){$P$ (pos=$1.2$)}
  \tkzLabelPoint[left](R){$R$ (pos=$-.2$)}
  \tkzLabelPoint[left](S){$S$ (pos=$\dfrac{2}{3}$)}
  \tkzDrawPoints(A,B,P,R,S)
\end{tikzpicture}
```

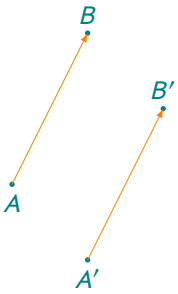
1.7 Point On A Circle: `\tkzDefPointOnCircle`




```
\begin{tikzpicture}[scale=0.7]
  \tkzDefPoints{0/0/A,4/0/B,0.8/3/C}
  \tkzDefCircle[circum](A,B,C)
  \tkzGetPoint{O} \tkzGetLength{rO}
  \tkzDefPointOnCircle[R=center O angle 30 radius \rO]
  \tkzGetPoint{J}
  \tkzDrawPoints(A,B,C)
  \tkzDrawCircle(O,J)
  \tkzDrawPoints(O,J)
  \tkzDrawPoint[red](J)
  \tkzLabelPoints[right](O,J)
\end{tikzpicture}
```

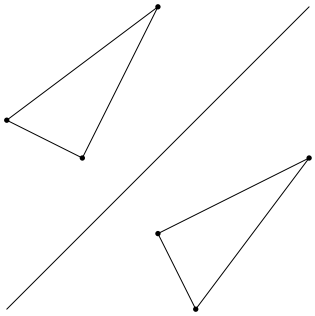
1.8 Transformation: `\tkzDefPointBy`

1.8.1 Translation



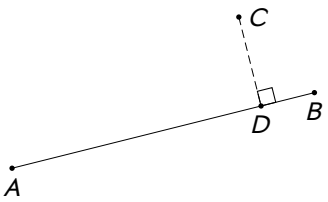

```
\begin{tikzpicture}[>=latex]
  \tkzDefPoints{0/0/A, 1/2/B, 2/1/B'}
  \tkzDefPointBy[translation= from B to A](B')
  \tkzGetPoint{A'}
  \tkzDrawPoints[teal](A,B,A',B')
  \tkzLabelPoints[above, color=teal](B,B')
  \tkzLabelPoints[below, color=teal](A,A')
  \tkzDrawSegments[orange,->](A,B A',B')
\end{tikzpicture}
```

1.8.2 Reflection



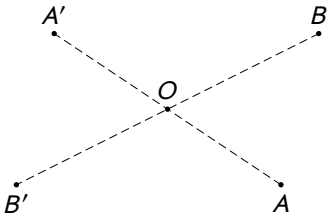
```
\begin{tikzpicture}
  \tkzDefPoints{0/0/X,4/4/Y,2/1/A,4/2/B,2.5/0/C}
  \tkzDrawSegment(X,Y)
  \tkzDefPointBy[reflection=over X--Y](A)
  \tkzGetPoint{A'}
  \tkzDefPointBy[reflection=over X--Y](B)
  \tkzGetPoint{B'}
  \tkzDefPointBy[reflection=over X--Y](C)
  \tkzGetPoint{C'}
  \tkzDrawPoints(A,B,C,A',B',C')
  \tkzDrawPolygons(A,B,C A',B',C')
\end{tikzpicture}
```

1.8.3 Projection



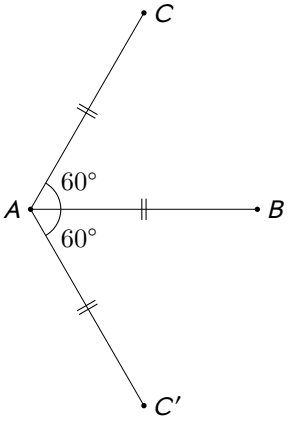

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,4/1/B,3/2/C}
  \tkzDrawSegment(A,B)
  \tkzDefPointBy[projection=onto A--B](C)
  \tkzGetPoint{D}
  \tkzDrawPoints(A,B,C,D)
  \tkzDrawSegment[densely dashed](C,D)
  \tkzMarkRightAngle[size=.2](B,D,C)
  \tkzLabelPoints(A,B,D)
  \tkzLabelPoints[right](C)
\end{tikzpicture}
```

1.8.4 Symmetry




```
\begin{tikzpicture}[scale=1]
  \tkzDefPoint(0,0){O}
  \tkzDefPoint(1.5,-1){A}
  \tkzDefPoint(2,1){B}
  \tkzDefPointsBy[symmetry=center O](B,A){}
  \tkzDrawSegments[densely dashed](A,A' B,B')
  \tkzDrawPoints(A,B,O,A',B')
  \tkzLabelPoints[below](A,B')
  \tkzLabelPoints[above](A',O,B)
\end{tikzpicture}
```

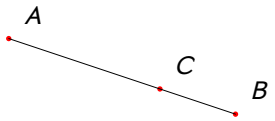
1.8.5 Rotation and Rotation In Rad




```
\begin{tikzpicture}
  \tkzDefPoint["$A$" left](0,0){A}
  \tkzDefPoint["$B$" right](3,0){B}
  \tkzDefPointBy[rotation=center A angle 60](B)
  \tkzGetPoint{C}
  \tkzDefPointBy[rotation in rad=center A angle -
pi/3](B)
  \tkzGetPoint{C'}
  \tkzLabelPoints[right](C,C')
  \tkzDrawPoints(A,B,C,C')
  \tkzDrawSegments(A,B A,C A,C')
  \tkzMarkAngles[mark=none, size=0.4cm](B,A,C C',A,B)
  \tkzLabelAngles[pos=0.75](B,A,C C',A,B){$60\degree$}
  \tkzMarkSegments[mark=||](A,B A,C A,C')
\end{tikzpicture}
```

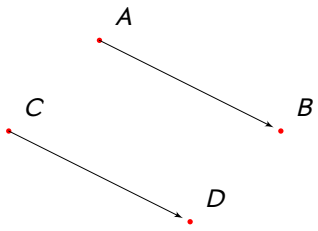
1.9 Defining Points Using A vector: `\tkzDefPointWith`

1.9.1 Linear

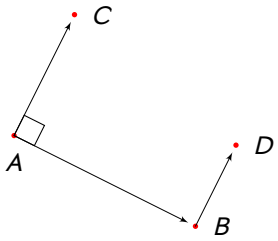



```
\begin{tikzpicture}
  \tkzDefPoint(1,3){A}
  \tkzDefPoint(4,2){B}
  \tkzDefPointWith[linear,K=2/3](A,B)
  \tkzGetPoint{C}
  \tkzDrawPoints[color=red](A,B,C)
  \tkzDrawSegment(A,B)
  \tkzLabelPoints[above right=3pt](A,B,C)
\end{tikzpicture}
```

1.9.2 Colinear



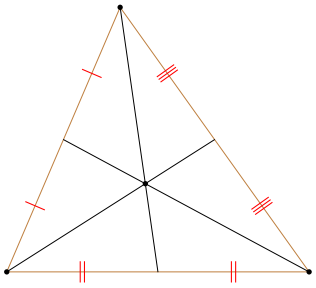

```
\begin{tikzpicture}[scale=1.2,
    vect/.style={->,shorten >=3pt,>=latex'}]
  \tkzDefPoint(2,3){A}
  \tkzDefPoint(4,2){B}
  \tkzDefPoint(1,2){C}
  \tkzDefPointWith[colinear=at C](A,B)
  \tkzGetPoint{D}
  \tkzDrawPoints[color=red](A,B,C,D)
  \tkzLabelPoints[above right=3pt](A,B,C,D)
  \tkzDrawSegments[vect](A,B C,D)
\end{tikzpicture}
```




```
\begin{tikzpicture}[scale=1.2,
    vect/.style={->,shorten >=3pt,>=latex'}]
  \tkzDefPoints{2/3/A, 4/2/B}
  \tkzDefPointWith[orthogonal,K=2/3](A,B)
  \tkzGetPoint{C}
  \tkzDefPointWith[orthogonal,normed,K=-1](B,A)
  \tkzGetPoint{D}
  \tkzDrawPoints[color=red](A,B,C,D)
  \tkzLabelPoints[right=3pt](B,C,D)
  \tkzLabelPoints[below=3pt](A)
  \tkzDrawSegments[vect](A,B A,C B,D)
  \tkzMarkRightAngle(B,A,C)
\end{tikzpicture}
```

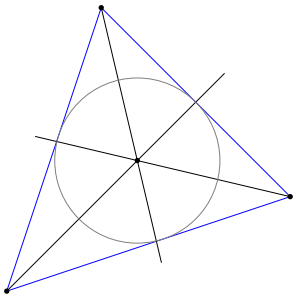
1.10 Triangle center: `\tkzDefTriangleCenter`

1.10.1 Centroid



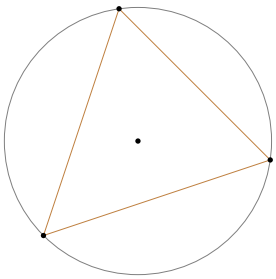
```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,4/0/B,1.5/3.5/C}
  \tkzDrawPolygon[color=brown](A,B,C)
  \tkzDefTriangleCenter[centroid](A,B,C) \tkzGetPoint{D}
  \tkzDrawPoints(A,B,C,D)
  \tkzDefMidPoint(A,B) \tkzGetPoint{E}
  \tkzDefMidPoint(B,C) \tkzGetPoint{F}
  \tkzDefMidPoint(C,A) \tkzGetPoint{G}
  \tkzDrawSegments(C,E A,F B,G)
  \tkzMarkSegments[mark=|,color=red](C,G A,G)
  \tkzMarkSegments[mark=||,color=red](A,E B,E)
  \tkzMarkSegments[mark=|||,color=red](B,F C,F)
\end{tikzpicture}
```

1.10.2 Incenter



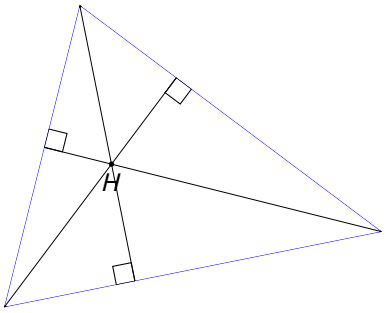
```
\begin{tikzpicture}[scale=1.25]
  \tkzDefPoints{0/1/A,3/2/B,1/4/C}
  \tkzDefTriangleCenter[in](A,B,C) \tkzGetPoint{I}
  \tkzDefPointBy[projection=onto A--C](I)
  \tkzGetPoint{Ib}
  \tkzDrawPolygon[color=blue](A,B,C)
  \tkzDrawPoints(A,B,C,I)
  \tkzDrawLines[add = 0 and 2/3](A,I B,I C,I)
  \tkzDrawCircle(I,Ib)
\end{tikzpicture}
```

1.10.3 Circumcenter



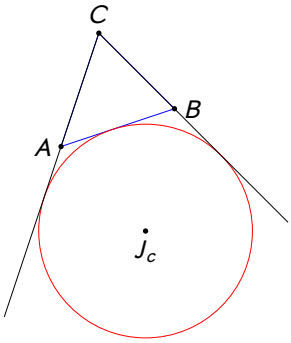
```
\begin{tikzpicture}
  \tkzDefPoints{0/1/A,3/2/B,1/4/C}
  \tkzDefTriangleCenter[circum](A,B,C) \tkzGetPoint{G}
  \tkzDrawPolygon[color=brown](A,B,C)
  \tkzDrawCircle(G,A)
  \tkzDrawPoints(A,B,C,G)
\end{tikzpicture}
```

1.10.4 Orthocenter




```
\begin{tikzpicture}
  \tkzDefPoint(0,0){A}
  \tkzDefPoint(5,1){B}
  \tkzDefPoint(1,4){C}
  \tkzClipPolygon(A,B,C)
  \tkzDefTriangleCenter[ortho](B,C,A) \tkzGetPoint{H}
  \tkzDefSpcTriangle[orthic,name=H](A,B,C){a,b,c}
  \tkzDrawPolygon[color=blue](A,B,C)
  \tkzDrawPoints(A,B,C,H)
  \tkzDrawLines[add=0 and 1](A,Ha B,Hb C,Hc)
  \tkzLabelPoint(H){$H$}
  \tkzAutoLabelPoints[center=H](A,B,C)
  \tkzMarkRightAngles(A,Ha,B B,Hb,C C,Hc,A)
\end{tikzpicture}
```

1.10.5 Excenter




```
\begin{tikzpicture}[scale=0.5]
  \tkzDefPoints{0/1/A,3/2/B,1/4/C}
  \tkzDefTriangleCenter[ex](B,C,A) \tkzGetPoint{J_c}
  \tkzDefPointBy[projection=onto A--B](J_c)
  \tkzGetPoint{Tc}
  \tkzDrawPolygon[color=blue](A,B,C)
  \tkzDrawPoints(A,B,C,J_c)
  \tkzDrawCircle[red](J_c,Tc)
  \tkzDrawLines[add=1.5 and 0](A,C B,C)
  \tkzLabelPoints[left](A)
  \tkzLabelPoints[right](B)
  \tkzLabelPoints[above](C)
  \tkzLabelPoints(J_c)
\end{tikzpicture}
```