exemples avec tkz-euclide

Vincent Crombez & Frédéric Léothaud

Table des matières

Introduction

Ce document se veut comme un aide mémoire rapide pour tracer des figures à l'aide du package `tkz-euclide`.

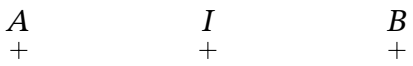
Le package est extrêmement complet, mais pour le quotidien, un nombre limité de commandes suffisent amplement.

Le package fonctionne de manière assez naturelle. L'utilisateur définit des objets, ce qui ne les affiche pas. Il est ensuite possible d'afficher tout ou partie des objets (nom, symbole, légende, etc). Il est possible de placer des points via leurs coordonnées, puis de tracer des droites ou segments passant par ces points. Le package permet de récupérer automatiquement les points d'intersection, de tracer des parallèles ou perpendiculaires à une droite passant par un point, etc. Ainsi, en changeant les valeurs des coordonnées de départ, l'ensemble de la figure reste valide, comme si l'on utilisait un logiciel de géométrie dynamique.

1 Points, segments et droites

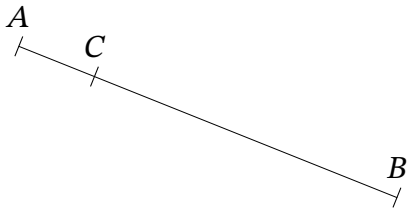
1.1 Milieu

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A, 5/0/B}
  \tkzDefMidPoint(A,B)\tkzGetPoint{I}
  \tkzDrawPoints(A,B,I)
  \tkzLabelPoints[above=3pt](A,B,I)
   %below,above,right,left
\end{tikzpicture}
```

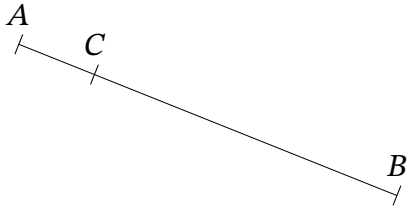


1.2 Point sur un segment

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A, 5/-2/B}
  \tkzDrawSegments(A,B)
  \tkzDefPointWith[colinear=at A, K=0.2](A,B) \tkzGetPoint{C}
  %Point sur le segment à 20% depuis le point A
  \tkzMarkSegments[pos=0,mark=|](A,B B,A C,A)
  \tkzLabelPoints[above=3pt](A,B,C)
\end{tikzpicture}
```

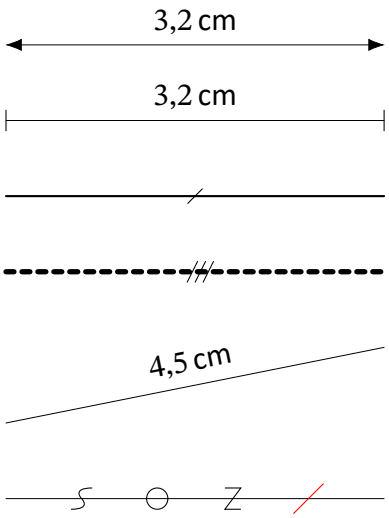



```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A, 5/-2/B}
  \tkzDrawSegments(A,B)
  \tkzDefPointOnLine[pos=0.2](A,B) \tkzGetPoint{C}
  %Point sur le segment à 20% depuis le point A
  \tkzMarkSegments[pos=0,mark=|](A,B B,A C,A)
  \tkzLabelPoints[above=3pt](A,B,C)
\end{tikzpicture}
```



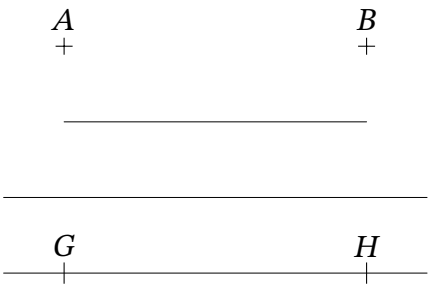
1.3 Styles de segments

```
\begin{tikzpicture}
  \tkzDefPoints{0/ 0/A, 5/ 0/B}
  \tkzDefPoints{0/-1/C, 5/-1/D}
  \tkzDefPoints{0/-2/E, 5/-2/F}
  \tkzDefPoints{0/-3/G, 5/-3/H}
  \tkzDefPoints{0/-5/I, 5/-4/J}
  \tkzDefPoints{0/-6/K, 5/-6/L}

  \tkzDrawSegments(C,D I,J K,L)
  \tkzDrawSegments[thick](E,F)
  \tkzDrawSegments[{Latex[scale=1.5]}-{Latex[scale=1.5]}](A,B)
  \tkzDrawSegments[style=dashed,line width = 2pt](G,H)

  \tkzLabelSegments[pos=0.5,above](A,B C,D){$\np[cm]{3.2}$}
  \tkzLabelSegments[pos=0.5,above,sloped](I,J){$\np[cm]{4.5}$}

  \tkzMarkSegments[pos=0,mark=|](C,D D,C)

  \tkzMarkSegments[pos=0.5,mark=s|||](G,H)
  \tkzMarkSegments[pos=0.5,mark=s|](E,F)

  \tkzMarkSegments[pos=0.2,mark=s](K,L)
  \tkzMarkSegments[pos=0.4,mark=o](K,L)
  \tkzMarkSegments[pos=0.6,mark=z](K,L)
  \tkzMarkSegments[pos=0.8,mark=s|,size=8pt,color=red](K,L)
\end{tikzpicture}
```



1.4 Droites

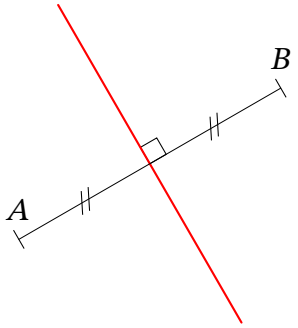
```
\begin{tikzpicture}
  \tkzDefPoints{0/ 0/A,4/ 0/B}
  \tkzDefPoints{0/-1/C,4/-1/D}
  \tkzDefPoints{0/-2/E,4/-2/F}
  \tkzDefPoints{0/-3/G,4/-3/H}

  \tkzDrawPoints(A,B)
  \tkzLabelPoints[above=2pt](A,B,G,H)
  \tkzDrawSegments(C,D)
  \tkzDrawLines(E,F H,G)
  \tkzMarkSegments[pos=0,mark=|](G,H H,G)
\end{tikzpicture}
```



2 Parallèles et perpendiculaires

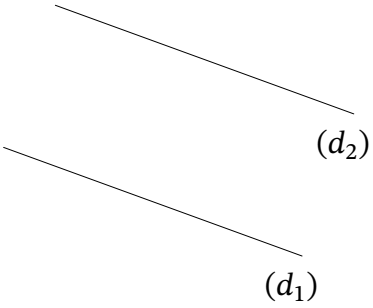
2.1 Médiatrice

```
\begin{tikzpicture}[rotate=30]
  \tkzDefPoints{0/0/A,4/0/B}
  \tkzDefMidPoint(A,B) \tkzGetPoint{I}
  \tkzDefLine[mediator,K=0.5](A,B)\tkzGetPoints{i1}{i2}

  \tkzMarkRightAngles(B,I,i1)

  \tkzDrawLines[thick, color=red](i1,i2)
  \tkzDrawSegments(A,B)

  \tkzLabelPoints[above=3pt](A,B)

  \tkzMarkSegments[pos=0,mark=|](A,B B,A)
  \tkzMarkSegments[pos=0.5,mark=s||](A,I B,I)
\end{tikzpicture}
```



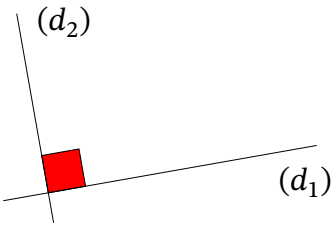
2.2 Parallèles

```
\begin{tikzpicture}[rotate=-20]
  \tkzDefPoints{0/0/A,4/0/B, 0/2/C}
  \tkzDefLine[parallel=through C](A,B) \tkzGetPoint{D}
  \tkzDrawLines(A,B C,D)
  \tkzLabelLine[pos=1.15,below=3pt](A,B){$(d_1)$}
  \tkzLabelLine[pos=1.15,below=3pt](C,D){$(d_2)$}
\end{tikzpicture}
```



2.3 Perpendiculaires

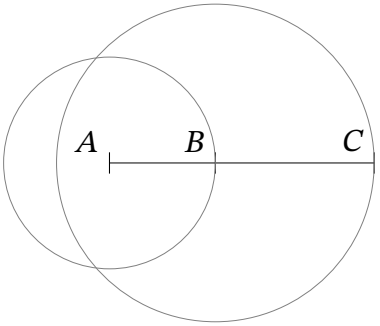
```
\begin{tikzpicture}[rotate=10]
  \tkzDefPoints{0/0/A,3/0/B,0/2/C}
  \tkzDefLine[orthogonal=through C](A,B)
  \tkzMarkRightAngles[size=0.5,fill=red](B,A,C)
  \tkzDrawLines(A,B A,C)
  \tkzLabelLine[pos=1.15,below=3pt](A,B){$(d_1)$}
  \tkzLabelLine[pos=1.15,right=3pt](A,C){$(d_2)$}
\end{tikzpicture}
```



3 Cercles

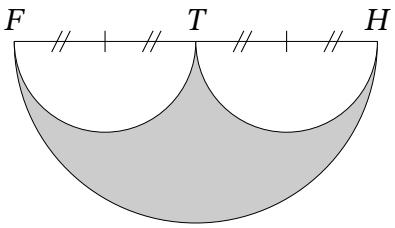
3.1 Cercles passant par un point

```
\begin{tikzpicture}[scale=0.7]
  \tkzDefPoints{0/0/A,2/0/B,5/0/C}
  \tkzDrawSegments(A,C)
  \tkzMarkSegments[pos=0,mark=|](A,B B,C C,A)
  \tkzLabelPoints[above left](A,B,C)
  \tkzDrawCircles(A,B B,C)
\end{tikzpicture}
```



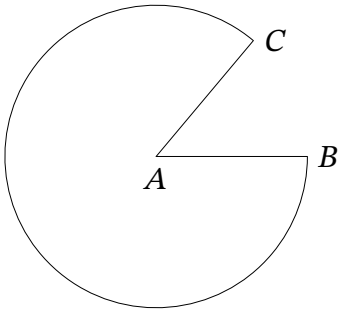
3.2 Demi-cercles

```
\begin{tikzpicture}[scale=1.2]
  \tkzDefPoints{0/0/F,1/0/A,2/0/T,3/0/B,4/0/H}
  \tkzLabelPoints[above](F,T,H)
  \tkzDrawSemiCircles[fill=black!20](T,F)
  \tkzDrawSemiCircles[fill=white](A,F B,T)
  \tkzDrawSegments(F,A A,T T,B B,H)
  \tkzMarkSegments[pos=0,mark=|](A,B B,A)
  \tkzMarkSegments[pos=0.5,mark=s||](F,A A,T T,B B,H)
\end{tikzpicture}
```



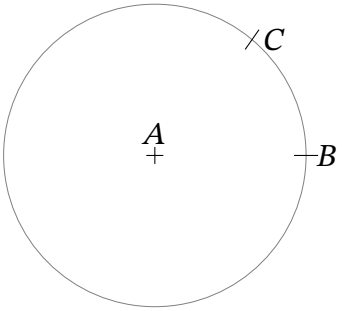
3.3 Arcs de cercle

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,2/0/B}
  \tkzDefPointOnCircle[through = center A angle 50 point B]
  \tkzGetPoint{C}
  \tkzDrawArc(A,C)(B)%(centre,point1)(point2)
  \tkzDrawSegments(A,B A,C)
  \tkzLabelPoints[right](B,C)
  \tkzLabelPoints[below](A)
\end{tikzpicture}
```



3.4 Point sur un cercle

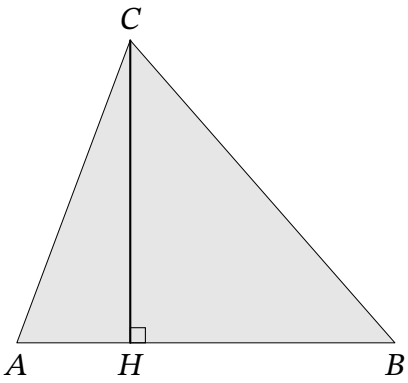
```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,2/0/B}
  \tkzDrawCircles(A,B)
  \tkzDefPointOnCircle[through = center A angle 50 point B]
  \tkzGetPoint{C}
  \tkzDrawPoints(A)
  \tkzDrawPoints[shape=strike out,rotate=-45](B)
  \tkzDrawPoints[shape=strike out,rotate=10](C)
  \tkzLabelPoints[right](B,C)
  \tkzLabelPoints[above](A)
\end{tikzpicture}
```



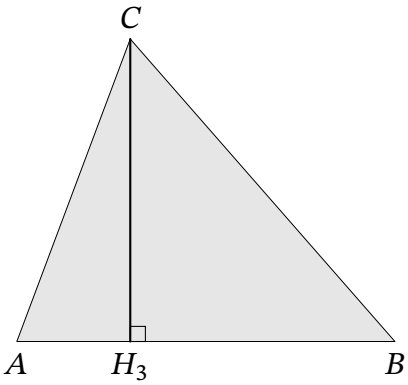
4 Triangles

4.1 Hauteurs

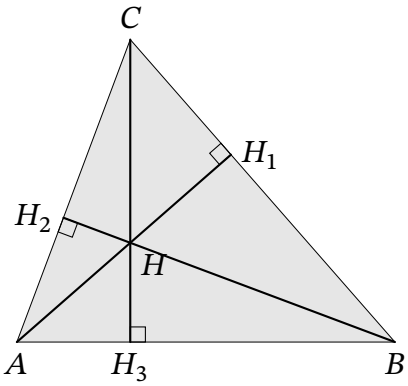
```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,6/0/B,1.5/4/C}
  \tkzDefLine[altitude](B,C,A) \tkzGetPoint{H}
  \tkzDrawPolygon[fill=black!10](A,B,C)
  \tkzMarkRightAngles[size=0.2](B,H,C)
  \tkzDrawSegments[thick](C,H)
  \tkzLabelPoints[below](A,B,H)
  \tkzLabelPoints[above](C)
\end{tikzpicture}
```



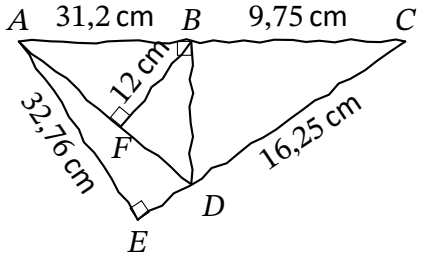

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,5/0/B,1.5/4/C}
  \tkzDefSpcTriangle[orthic](A,B,C){H_1,H_2,H_3}
  \tkzDrawPolygon[fill=black!10](A,B,C)
  \tkzMarkRightAngles[size=0.2](B,H_3,C)
  \tkzDrawSegments[thick](C,H_3)
  \tkzLabelPoints[below](A,B,H_3)
  \tkzLabelPoints[above](C)
\end{tikzpicture}
```




```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,5/0/B,1.5/4/C}
  \tkzDefSpcTriangle[orthic](A,B,C){H_1,H_2,H_3}
  \tkzDefTriangleCenter[ortho](B,C,A)\tkzGetPoint{H}
  \tkzDrawPolygon[fill=black!10](A,B,C)
  \tkzMarkRightAngles[size=0.2](B,H_3,C A,H_2,B C,H_1,A)
  \tkzDrawSegments[thick](C,H_3 B,H_2 A,H_1)
  \tkzLabelPoints[below](A,B,H_3)
  \tkzLabelPoints[above](C)
  \tkzLabelPoints[right](H_1)
  \tkzLabelPoints[left](H_2)
  \tkzLabelPoints[below right](H)
\end{tikzpicture}
```

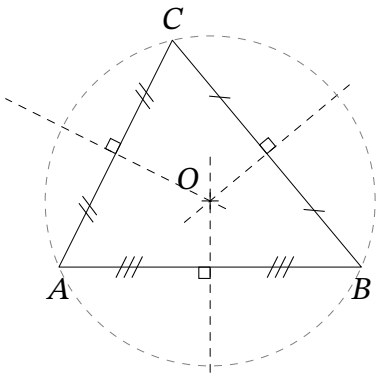


```
\begin{tikzpicture}[scale=0.73]
  \tkzDefPoints{0/0/A, 5/0/B, 7/0/C, 4/-2/g}
  \tkzDefLine[altitude](g,A,C) \tkzGetPoint{E}
  \tkzDefPointWith[colinear=at E, K=0.2](E,C) \tkzGetPoint{D}
  \tkzDefLine[altitude](A,D,C) \tkzGetPoint{B}
  \tkzDefLine[altitude](A,B,D) \tkzGetPoint{F}
  \tkzDrawSegments[handdrawn,thick](A,C A,E E,C A,D D,B B,F)
  \tkzLabelSegments[above](A,B){$\np[cm]{31.2}$}
  \tkzLabelSegments[above](B,C){$\np[cm]{9.75}$}
  \tkzLabelSegments[below,sloped](A,E){$\np[cm]{32.76}$}
  \tkzLabelSegments[below,sloped](D,C){$\np[cm]{16.25}$}
  \tkzLabelSegments[above,sloped](F,B){$\np[cm]{12}$}
  \tkzLabelPoints[above](A,B,C)
  \tkzLabelPoints[below](F,E)
  \tkzLabelPoints[below right](D)
  \tkzMarkRightAngles(A,E,C)
  \tkzMarkRightAngles(A,B,D)
  \tkzMarkRightAngles(A,F,B)
\end{tikzpicture}
```



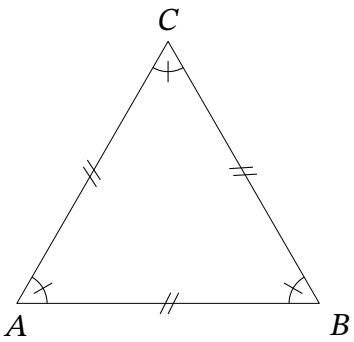
4.2 Médiatrices

```
\begin{tikzpicture}[scale=0.5]
  \tkzDefPoints{0/0/A,8/0/B,3/6/C}
  \tkzDefMidPoint(A,B) \tkzGetPoint{M_C}
  \tkzDefMidPoint(B,C) \tkzGetPoint{M_A}
  \tkzDefMidPoint(C,A) \tkzGetPoint{M_B}

  \tkzDefLine[mediator,K=0.3](A,B)\tkzGetPoints{M_1}{M_2}
  \tkzDefLine[mediator,K=0.3](B,C)\tkzGetPoints{M_3}{M_4}
  \tkzDefLine[mediator,K=0.4](C,A)\tkzGetPoints{M_5}{M_6}
  \tkzDrawLines[dashed](M_1,M_2 M_3,M_4 M_5,M_6)

  \tkzDefTriangleCenter[circum](A,B,C)\tkzGetPoint{O}

  \tkzMarkSegments[pos=0.25,mark=s|](B,C)
  \tkzMarkSegments[pos=0.75,mark=s|](B,C)
  \tkzMarkSegments[pos=0.25,mark=s||](A,C)
  \tkzMarkSegments[pos=0.75,mark=s||](A,C)
  \tkzMarkSegments[pos=0.25,mark=s|||](B,A)
  \tkzMarkSegments[pos=0.75,mark=s|||](B,A)

  \tkzDrawPolygon(A,B,C)
  \tkzDrawCircles[dashed](O,A)
  \tkzDrawPoints(O)

  \tkzMarkRightAngles[size=0.3](M_4,M_A,C M_6,M_B,C M_2,M_C,A)

  \tkzLabelPoints[below](A,B)
  \tkzLabelPoints[above](C)
  \tkzLabelPoints[above left](O)
\end{tikzpicture}
```

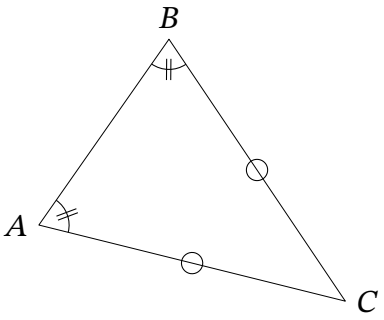


4.3 Triangles particuliers

```
\begin{tikzpicture}
  \tkzDefPoints{0/0/A,4/0/B}
  \tkzDefEquilateral(A,B)\tkzGetPoint{C}
  \tkzDrawPolygon(A,B,C)

  \tkzMarkAngles[size=0.4cm,mark=|](B,A,C C,B,A A,C,B)
  \tkzMarkSegments[mark=s||](A,B B,C C,A)

  \tkzLabelPoints[below](A)
  \tkzLabelPoints[below right](B)
  \tkzLabelPoints[above](C)
\end{tikzpicture}
```




```
\begin{tikzpicture}[rotate=55]
  \tkzDefPoints{0/0/A,3/0/B}
  \tkzDefLine[mediator](A,B)\tkzGetPoints{c}{d}
  \tkzDefPointWith[linear,K=1.25](c,d) \tkzGetPoint{C}
  \tkzDrawPolygon(A,B,C)

  \tkzMarkAngles[size=0.4cm,mark=||](C,A,B A,B,C)
  \tkzMarkSegments[mark=o](B,C C,A)

  \tkzLabelPoints[left](A)
  \tkzLabelPoints[above](B)
  \tkzLabelPoints[right](C)
\end{tikzpicture}
```




```
\begin{tikzpicture}[rotate=25,scale=0.8]
  \tkzDefPoints{0/0/A,4/0/B}
  \tkzDefLine[orthogonal=through A](A,B)\tkzGetPoint{c}
  \tkzDefPointWith[linear,K=1.25](A,c) \tkzGetPoint{C}
  \tkzDrawPolygon(A,B,C)

  \tkzMarkRightAngles(B,A,C)

  \tkzLabelPoints[below](A)
  \tkzLabelPoints[right](B)
  \tkzLabelPoints[above left](C)
\end{tikzpicture}
```