

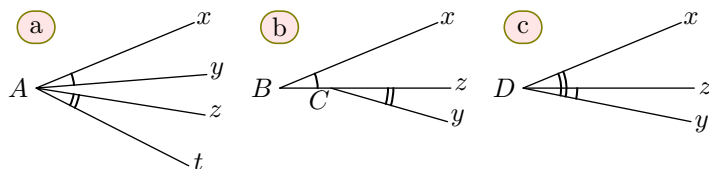
1. Definition of adjacent angles

E.2974   

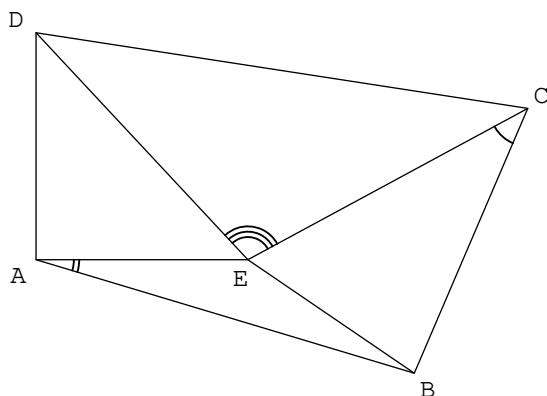
Definition: Two angles are said to be **adjacent** if they satisfy the following three conditions:

- They have the same vertex.
- They share a common side.
- they are located on either side of this common side.

In each of the three cases below, justify that the coded pairs of angles are not a pair of adjacent angles:

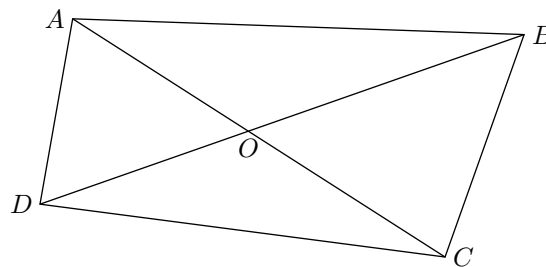


E.2975    Consider a quadrilateral $ABCD$ and a point E inside it.



For each of the angles coded in the figure, name at least one associated adjacent angle.

E.10858    Consider the quadrilateral $ABCD$ shown below. We name O the intersection of its diagonals:

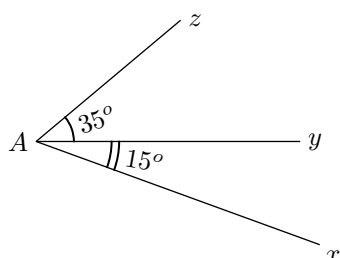


- 1 Name the angle adjacent to the angle $\widehat{OBC}$
- 2 Name the angle adjacent to the angle $\widehat{ODA}$
- 3 Name angle adjacent to angle $\widehat{DOC}$

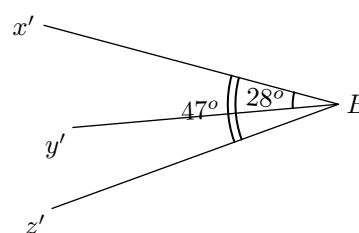
2. Measurement and adjacent angles

E.11476   

- 1 Consider the figure below composed of point A and rays $[Ax)$, $[Ay)$, $[Az)$:

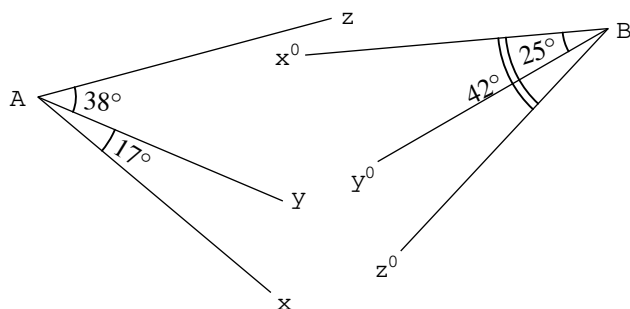


- a Name a pair of adjacent angles.
 - b Deduce the measure of angle $\widehat{xAz}$
- 2 Consider the figure below composed of point B and rays $[Bx')$, $[By')$, and $[Bz')$:



- a Name a pair of adjacent angles.
- b Deduce the measure of angle $\widehat{y'Bz'}$

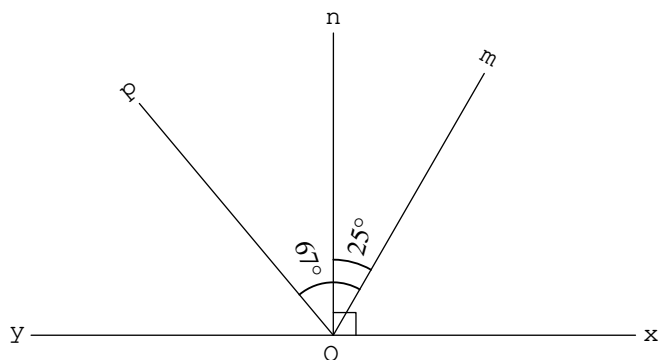
E.5621    We consider the two configurations below :



- 1 Determine the measure of the angle $\angle xAz$. Justify your approach.
- 2 Determine the measure of the angle $\angle y'Bz'$. Justify your approach.

E.2553    The figure below is composed of five half-lines with origin the point O .

The angle $\angle yOx$ is a flat angle and the angle $\angle nOx$ is a right angle.



Note: the figure was not constructed with true dimensions.

- 1
 - a Justify that the angles $\angle xOm$ and $\angle mOn$ are adjacent.
 - b Determine the measure of the angle $\angle mOx$.
- 2
 - a Noting that the angles $\angle mOn$ and $\angle nOp$ are adjacent, justify, by explanation and calculation, that the measure of the angle $\angle pOn = 42^\circ$.

- b Noting that the angles $\angle yOp$ and $\angle pOn$ are adjacent angles, determine the measure of the angle $\angle yOp$

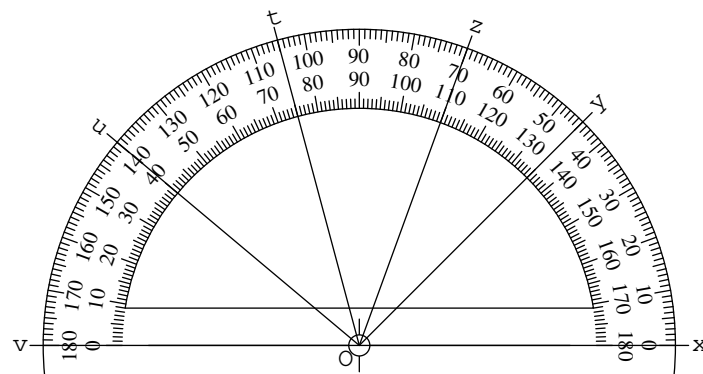
E.10859    Consider the three half-lines $[AB)$, $[AC)$, $[AD)$ shown below :



We have the measurements: $\widehat{BAD} = 65^\circ$; $\widehat{CAD} = 28^\circ$

- 1 Justify that the angles $\widehat{BAC}$ and $\widehat{CAD}$ are adjacent.
- 2 Give the measure of the angle $\widehat{BAC}$. Justify your approach.

E.2457    Consider the protractor below on which some half-lines have been drawn :



- 1
 - a Are the angles $\widehat{xOy}$ and $\widehat{yOz}$ adjacent? Justify your answer.
 - b By reading on the protractor, give the measures of the angles $\widehat{xOy}$ and $\widehat{xOz}$.
 - c Deduce the measure of the angle $\widehat{yOz}$.
- 2 Are the angles $\widehat{tOy}$ and $\widehat{zOt}$ adjacent? Justify your answer.
- 3
 - a Are the angles $\widehat{zOu}$ and $\widehat{uOv}$ adjacent?
 - b Deduce the measure of the angle $\widehat{zOu}$.

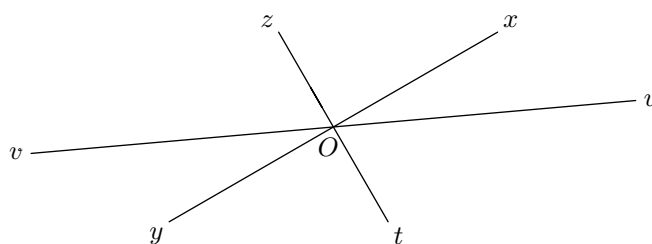
3. Definition and complementary, supplementary and opposite angles through the vertex

E.10800   

Definition: Two angles are said to be **opposite at the vertex** if they satisfy the following three properties:

- they have the same vertex,
- their sides are carried by two lines,
- their sides are extensions of each other.

Consider the three lines (xy) , (zt) , (uv) that intersect at point O .



For each question, name the angle opposite the vertex of the angle mentioned :

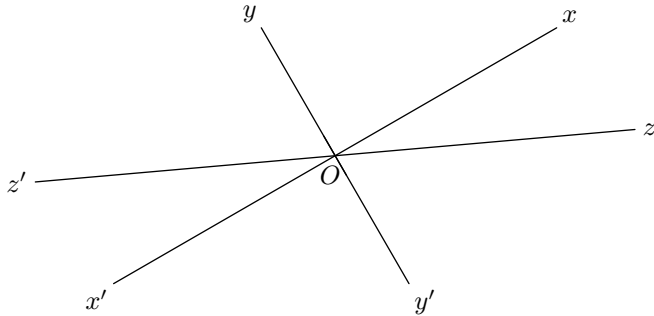
- a $\widehat{vOy}$
- b $\widehat{xOt}$
- c $\widehat{zOu}$

E.5622   

Definition :

- Two adjacent angles are said to be **complementary** if the sum of their measures is 90° .
- Two adjacent angles are said to be **supplementary** if the sum of their measures is 180° .

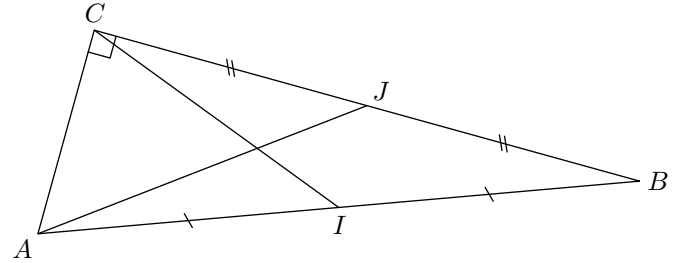
Consider the configuration below, consisting of three lines that intersect at point O .



- Name a pair of adjacent and complementary angles that includes angle $\widehat{zOy'}$.

- Name another pair of adjacent and complementary angles in this configuration.
- Name a pair of adjacent supplementary angles that include angle $\widehat{x'Oz'}$.
 - Name another pair of adjacent supplementary angles present in this configuration.

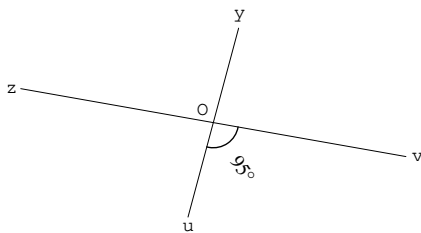
E.6670    Consider the figure below resting on a right triangle ABC at A . Points I and J are the midpoints of segments $[AB]$ and $[BC]$, respectively.



- List all pairs of adjacent and complementary angles.
- List all pairs of adjacent and supplementary angles.

4. Measurement and complementary, supplementary and opposite angles through the vertex

E.1403    Consider the two lines (yu) and (vz) intersecting at the point O and such that $\angle uOv = 95^\circ$



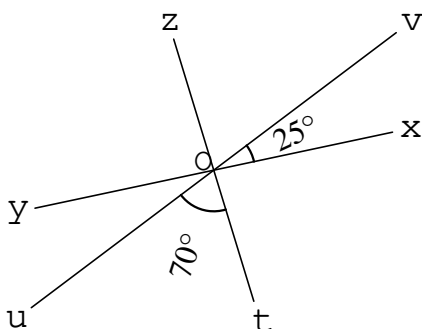
Determine the measure of the angle $\angle zOu$. Justify your answer.

E.2063   

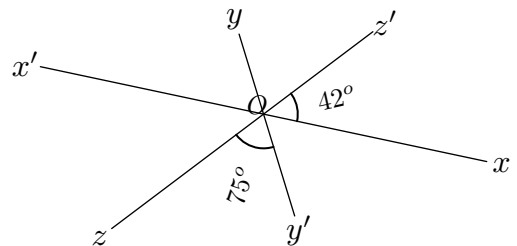
The figure below is composed of three straight lines intersecting at O .

- Give the measure of the angle $\widehat{yOu}$. Justify.

- Determine the measure of the angle $\widehat{yOz}$. Justify.



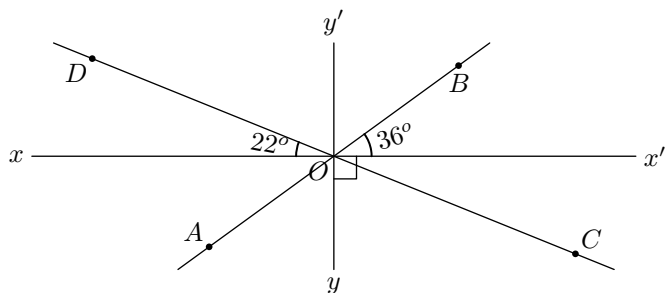
E.11477    Consider the three lines (xx') , (yy') , (zz') intersecting at point O :



The measurements are given: $\widehat{xOz'} = 42^\circ$; $\widehat{zOy'} = 75^\circ$

- Give the measurement of angle $\widehat{yOz'}$.
- Justify that angles $\widehat{xOz'}$ and $\widehat{z'Oy}$ form a pair of adjacent angles.
- Deduce the measure of angle $\widehat{x'Oy}$.

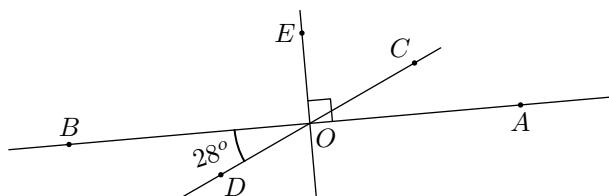
E.6669    Consider the figure below, composed of four lines intersecting at point O , and more specifically, lines (xx') and (yy') , which are perpendicular to each other:



Without justification, give the measure of the following angles:

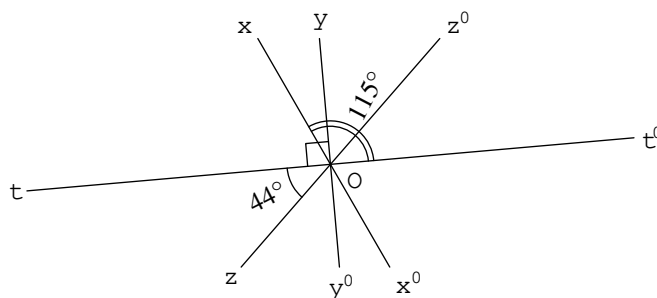
- a) $\widehat{BOy}$ b) $\widehat{y'OD}$ c) $\widehat{DOA}$ d) $\widehat{DOB}$

E.10860    Consider the three straight lines (AB) , (CD) , (EO) intersecting at the point O and such that $(EO) \perp (AB)$:



- 1 Give the measure of the angle $\widehat{COA}$. Justify.
- 2 Give the measure of the angle $\widehat{COE}$. Justify.

E.2982    In the plane we consider the four straight lines (xx') , (yy') , (zz') , (tt') intersecting at the same point O :



The protractor must not be used in this exercise.

- 1 Using adjacent angles and noting the calculations made, determine the measure of the angles below:

- a) $\widehat{zOy}$ b) $\widehat{tOx}$ c) $\widehat{xOy}$

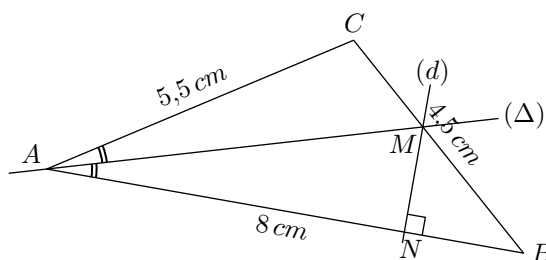
- 2 a) Determine the measure of the angle $\widehat{x'Ot'}$.
b) Deduce the measure of angle $\widehat{zOx'}$.

E.1405   Complete the table below:

Mesure de angle $\hat{A}$	Mesure de angle $\hat{B}$	Les angles $\hat{A}$ et $\hat{B}$ sont
37°		complementary
67.5°	112.5°	
	34°	supplémentaires
27.19°	62.81°	

5. Angle bisector: definition

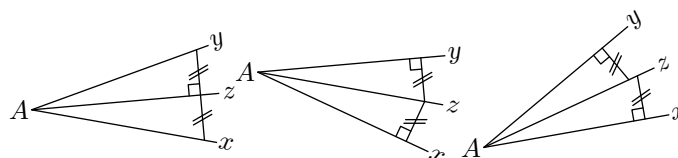
E.5643   Consider the following configuration:



- 1 Specify the nature of the straight line (AM) relative to the triangle ABC ?

- 2 a) Reproduce this figure in true dimension.
b) Write a plotting program for this figure.

E.5645   In each of the three cases below, specify which of the half-lines $[A,z)$ la(s)quelle(s) represent the bisector of the angle $\widehat{xAy}$:

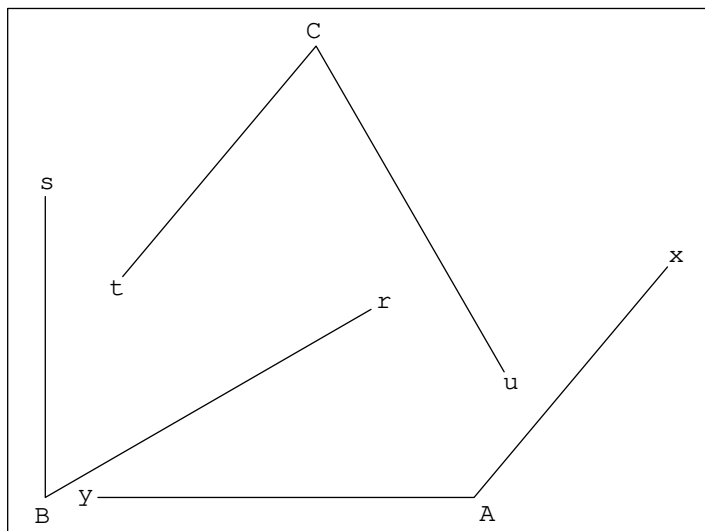


6. Angle bisector: drawing with a protractor

E.2458



The box below shows three angles $\widehat{xAy}$,

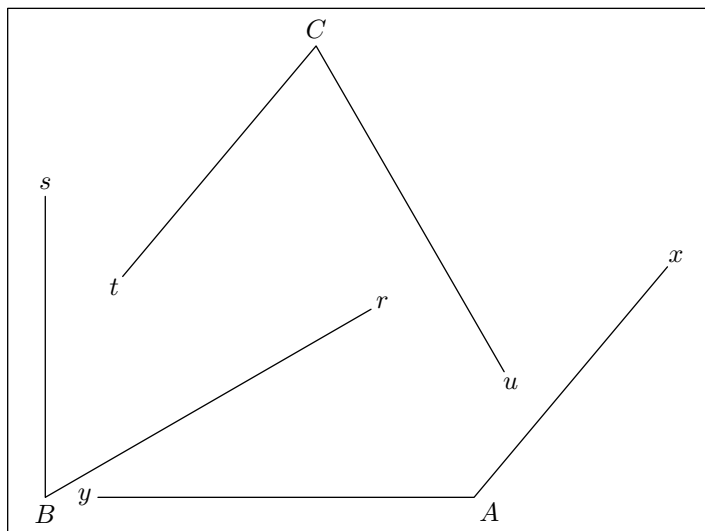


Using a protractor and ruler, construct the bisectors of these three angles.

E.6445



The box below shows three angles $\widehat{xAy}$,

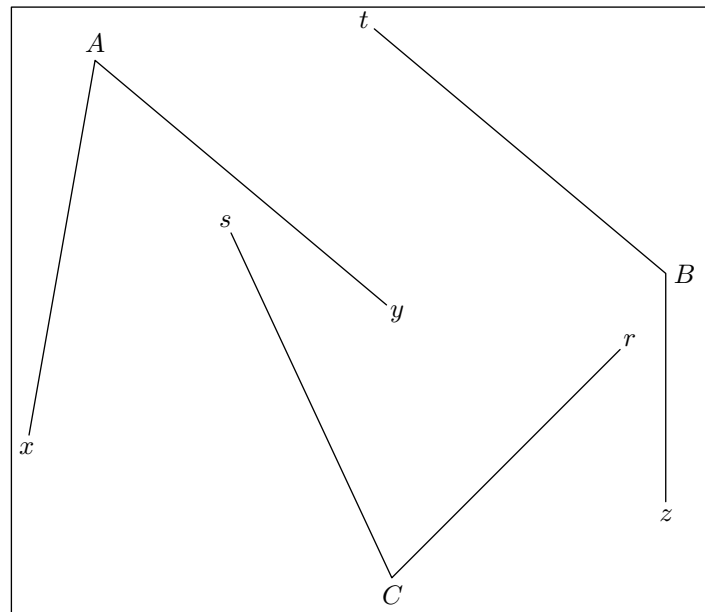


Using a protractor and ruler, construct the bisectors of these three angles.

E.3920



Consider the three angles $\widehat{xAy}$, $\widehat{sBr}$ and



- 1
 - a Using **rappporteur**, give the measure of the angle $\widehat{xAy}$.
 - b Using **protractor** and ruler, draw the bisector of the angle $\widehat{xAy}$.

- ② Using the **compass** and ruler, trace the bisector of the angle $\widehat{tBz}$ and the angle $\widehat{sCr}$.

E.1223   (We'll leave the construction traces)

- 1 a Draw the triangle ABC such that:
 $AB = 7.5\text{ cm}$; $BC = 4\text{ cm}$; $AC = 8\text{ cm}$
- b What can we say about the nature of the triangle ABC ?

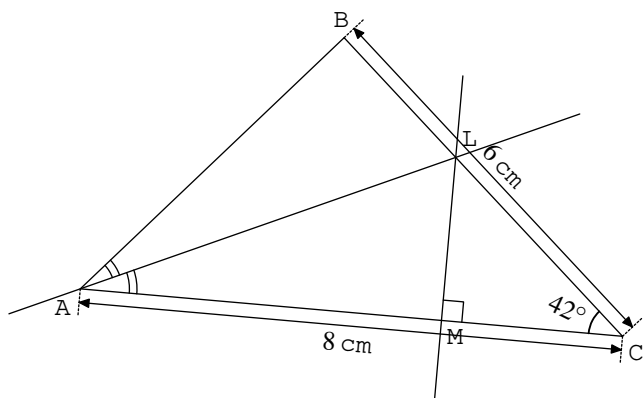
- 2 a Draw the triangle MNP such that:
 $MN = 5\text{ cm}$; $MP = 8\text{ cm}$; $\widehat{NMP} = 75^\circ$
- b Draw the bisector of the angle $\widehat{MNP}$.

7. Tracing program with protractor

E.1666



In the plan, we consider the



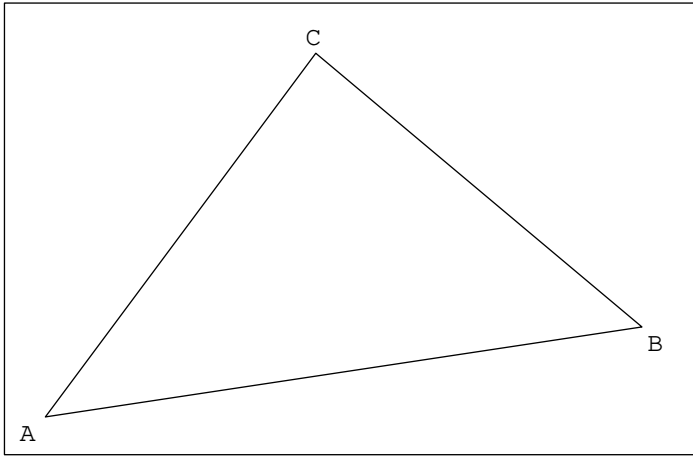
- 1 Give the program of plot of the figure above.

- 2
 - a Draw the triangle ABC at using a rule graduated and a reporter.
 - b Finish to reproduce the figure by using the rule and the compass.

E.2479



Consider the triangle ABC shown below :



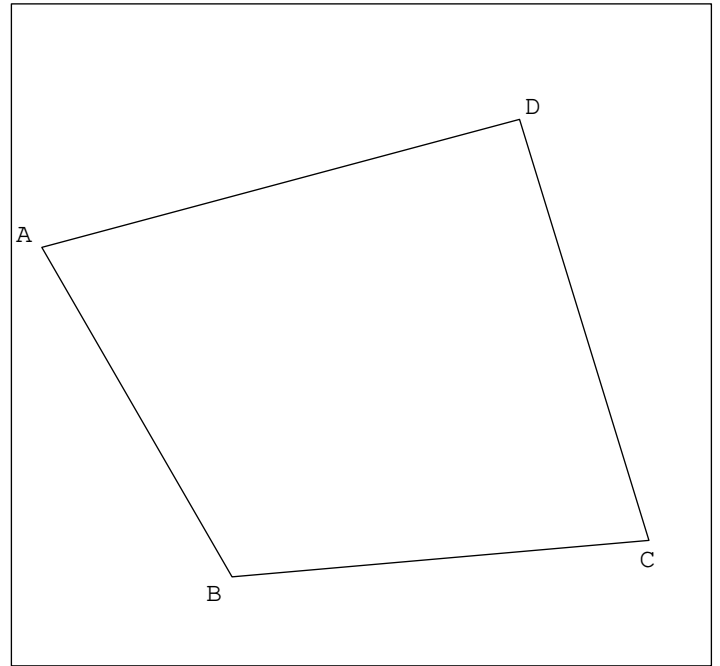
- 1 a Using the protractor and ruler, draw the bisectors arising from the three vertices of this triangle.
- b Name O the point of concurrence of the three bisectors.
- 2 a Draw a circle with center O entirely contained within the triangle ABC and whose radius is as large as possible.
- b What is special about this circle?

Note : this circle is called the **circle inscribed** in the triangle ABC .

E.6637



Consider the quadrilateral $ABCD$ shown below :



- 1 Draw the line (d) perpendicular to the line (BC) and through the point D .
- 2 Draw the line (d') parallel to the line (CD) through the point B .
- 3 Using the protractor, draw the bisector of the angle $\angle DAB$.
- 4 Draw the perpendicular bisector of segment $[CD]$.

E.2481



Carry out the drawing program below. Use protractor and square.

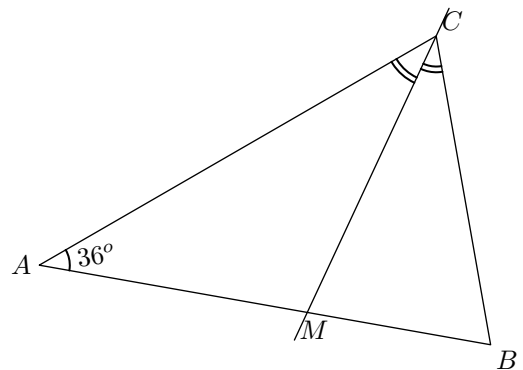
- 1 Draw the triangle ABC verifying the following measures :
 $AB = 8 \text{ cm}$; $BC = 5.5 \text{ cm}$; $AC = 7 \text{ cm}$
- 2 Draw the perpendicular bisector of segment $[AB]$.
- 3 Draw the bisector of the angle $\widehat{CBA}$
- 4 Draw the perpendicular to the line (BC) passing through A .

8. Reasoning About the Bisector

E.5644



Consider the configuration below where ABC is an isosceles triangle and the angle of the main vertex measures 36° . The line (CM) is the bisector of the angle $\widehat{ACB}$



- 1 Determine the measures of the three angles of the triangle BCM .
- 2 Deduce the nature of the triangle BCM .

E.1659



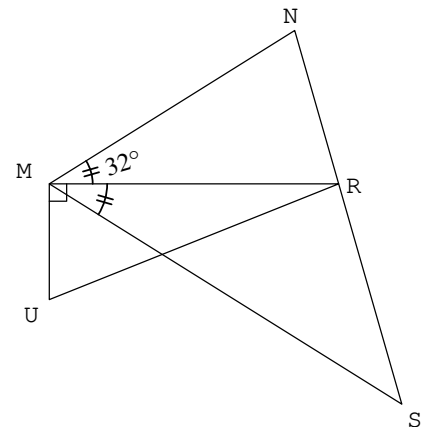
Consider the figure below :

Without using the protractor, determine the measure of the following angles :

① $\widehat{UMR}$

② $\widehat{RMS}$

③ $\widehat{UMS}$



9. *An Approach to the Sum of the Angles in a Triangle*

E.11765



L'exercice n'existe pas.