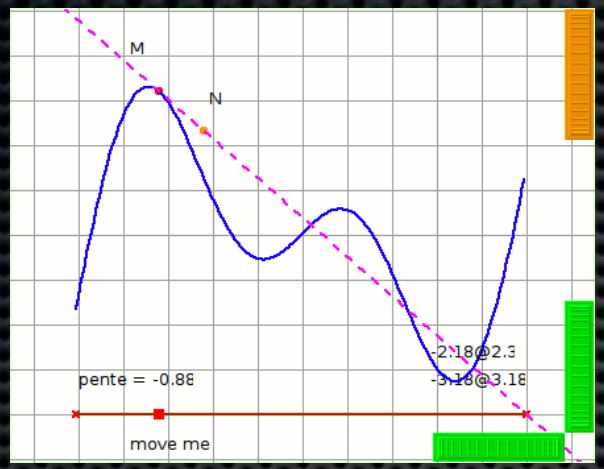
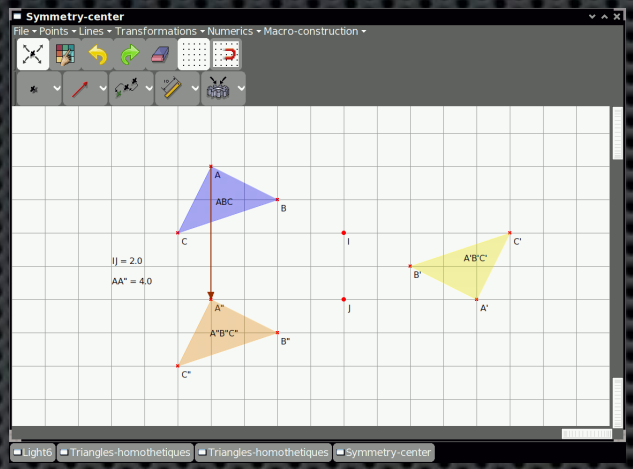
Dr. Geo

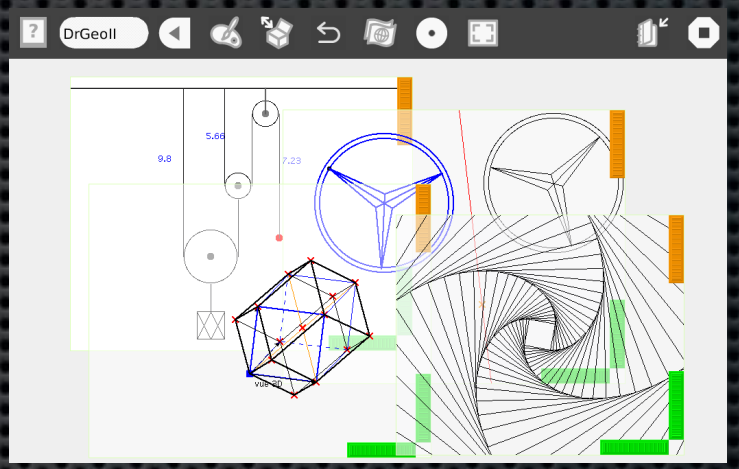
Interactive Geometry with Pharo Smalltalk

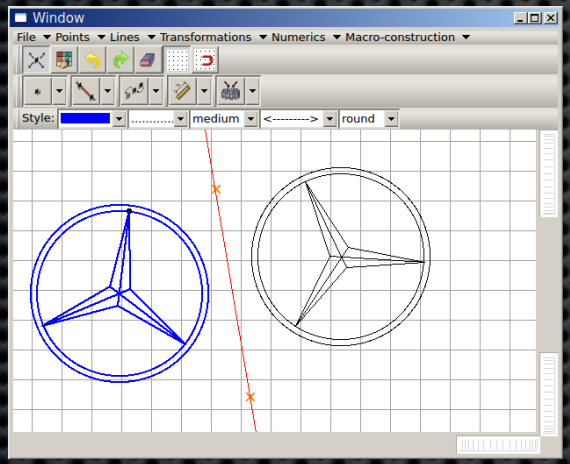
Hilaire Fernandes

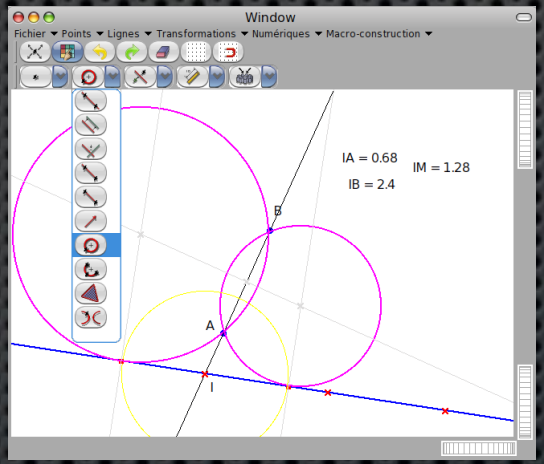
Interactive Geometry ?

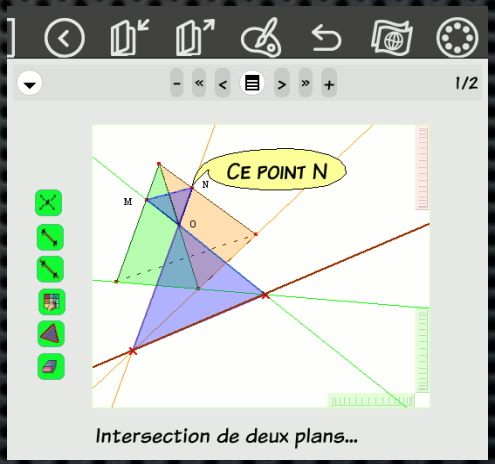


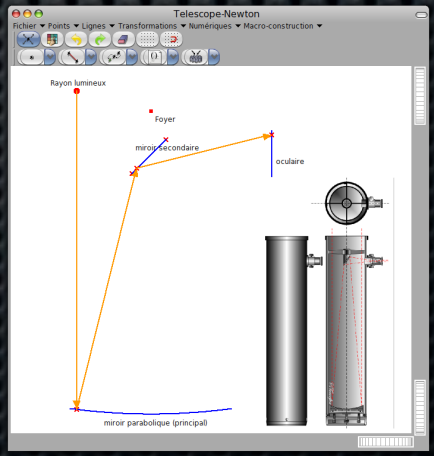




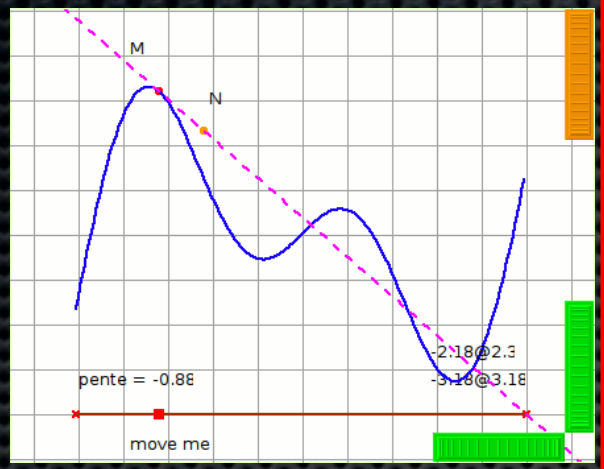


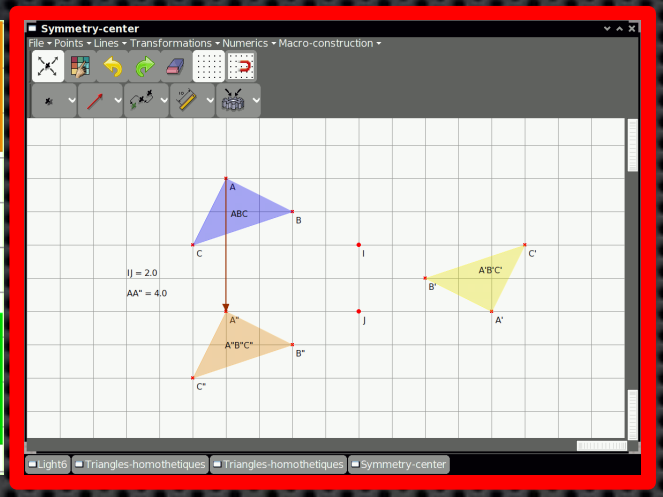


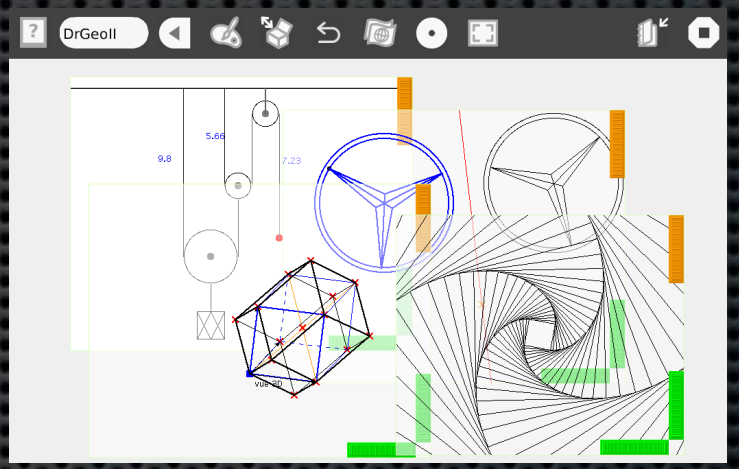


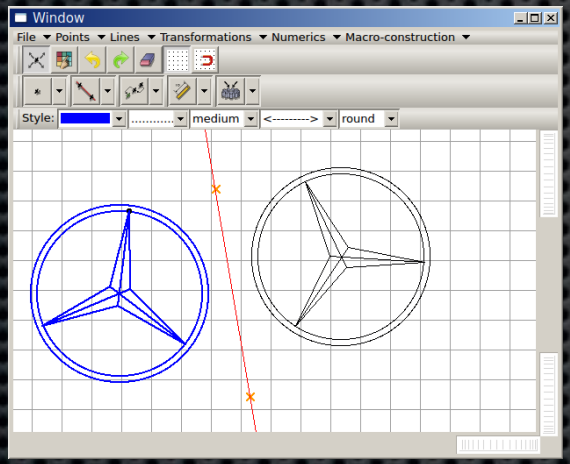


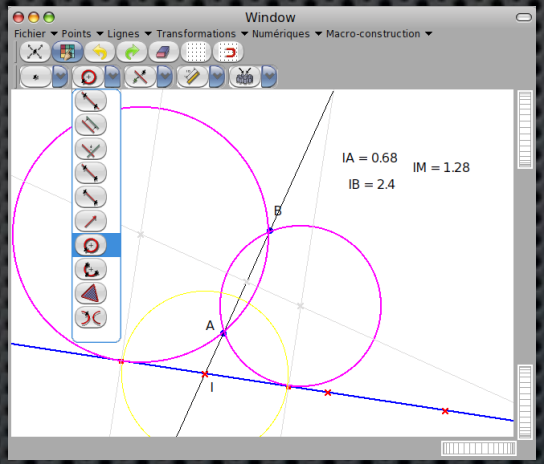
Euclidean Geometry

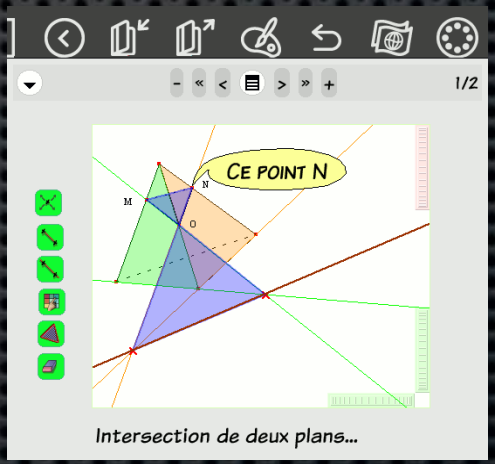


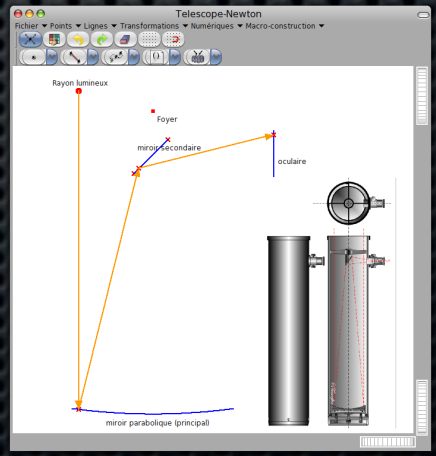




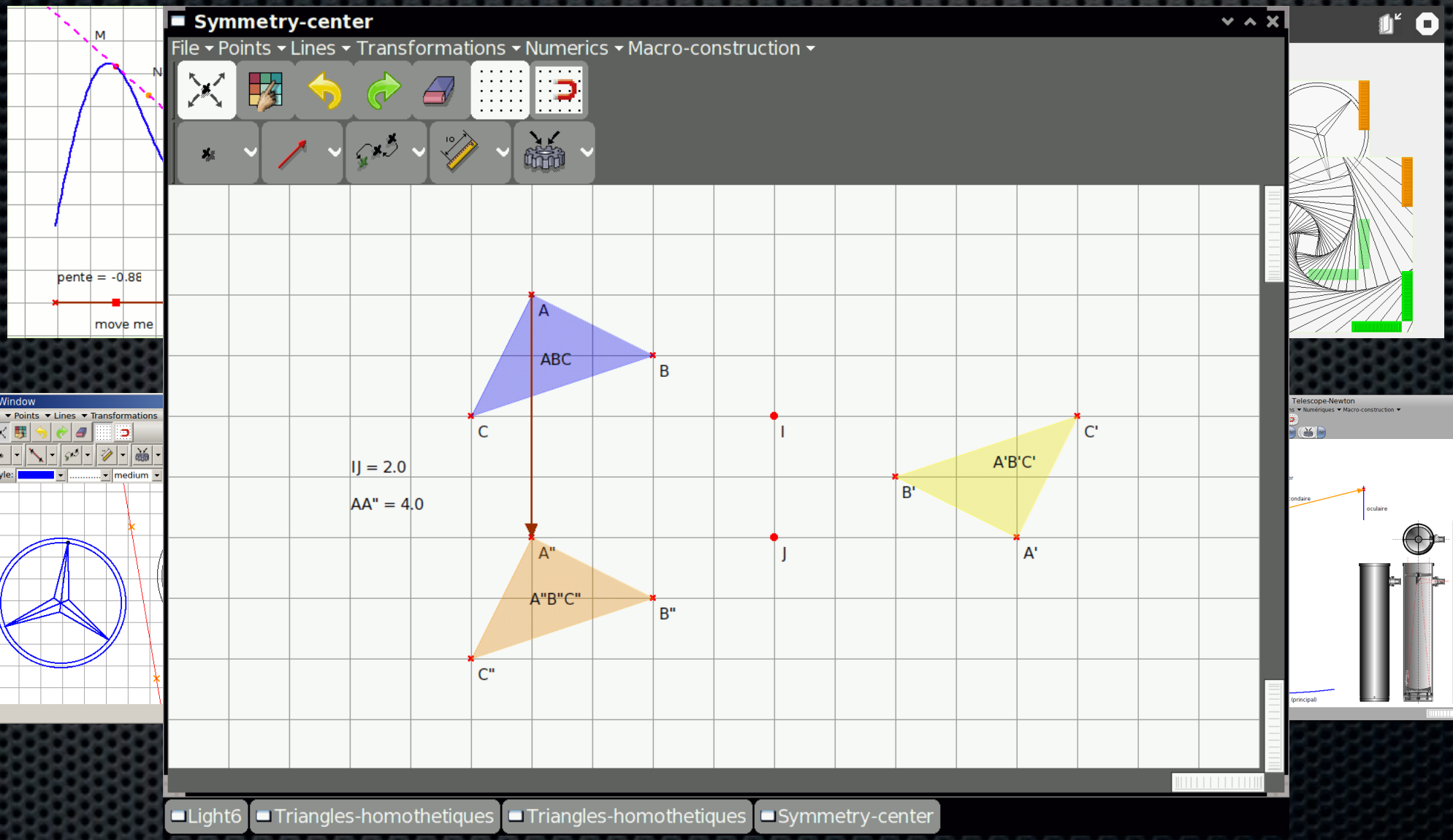




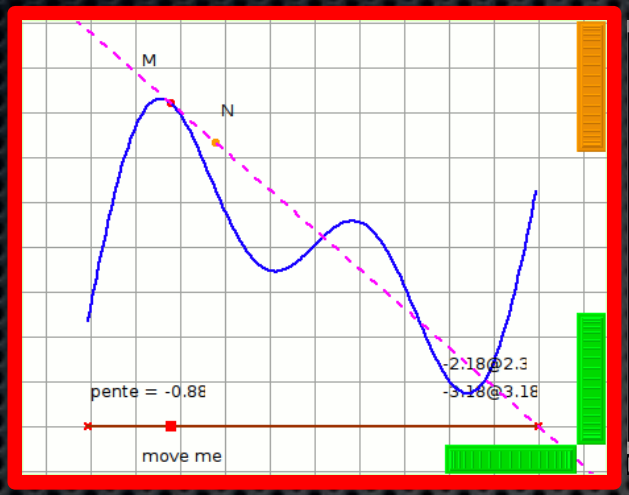


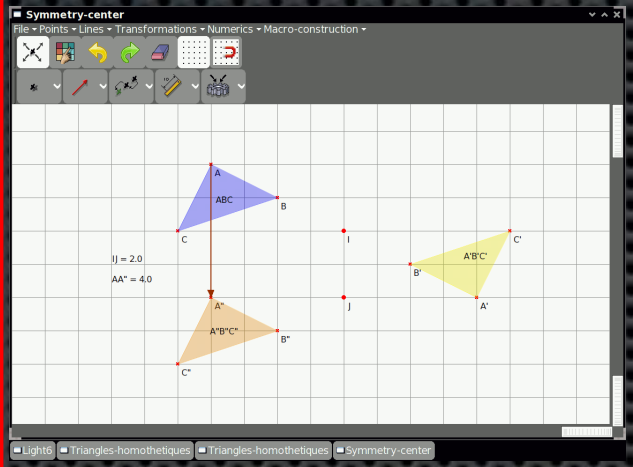


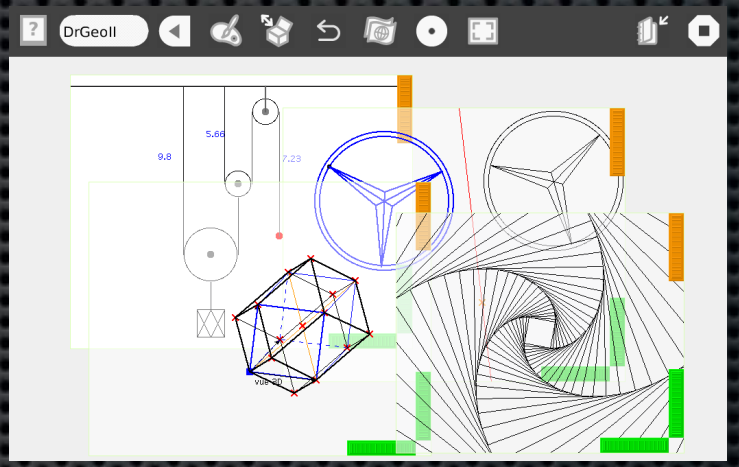
Zoom

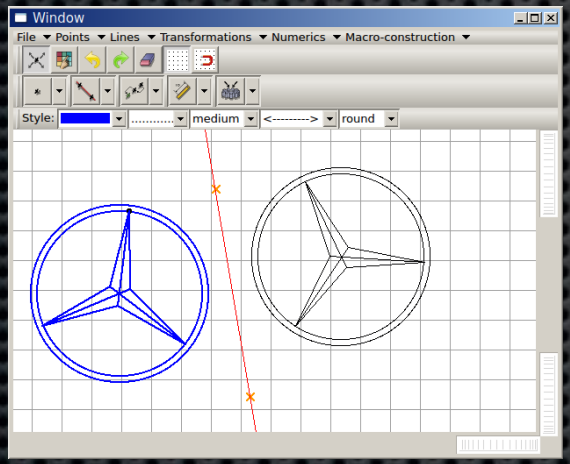

Symmetry-center
File Points Lines Transformations Numerics Macro-construction
A
ABC
B
C
I
C'
A'B'C'
B'
IJ = 2.0
AA" = 4.0
A"
A"B"C"
B"
C"
J
A'
pente = -0.88
move me
Window
Light6
Triangles-homothetiques
Triangles-homothetiques
Symmetry-center

Analysis


M
N
pente = -0.88
move me


Symmetry-center
File Points Lines Transformations Numerics Macro-construction
ABC
A'B'C'
A"B"C"
IJ = 2.0
AA" = 4.0
Light6
Triangles-homothetiques
Triangles-homothetiques
Symmetry-center


DrGeoII


Window
File Points Lines Transformations Numerics Macro-construction
Style:
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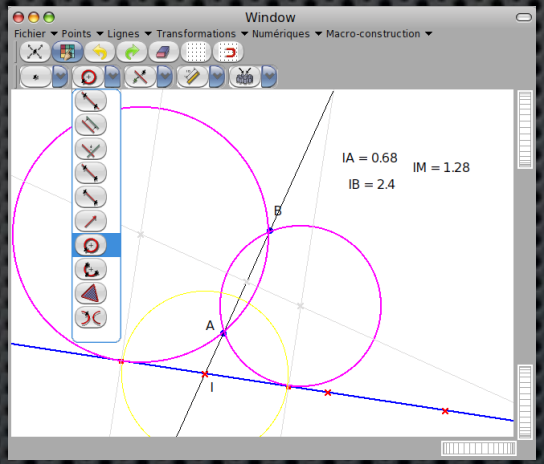
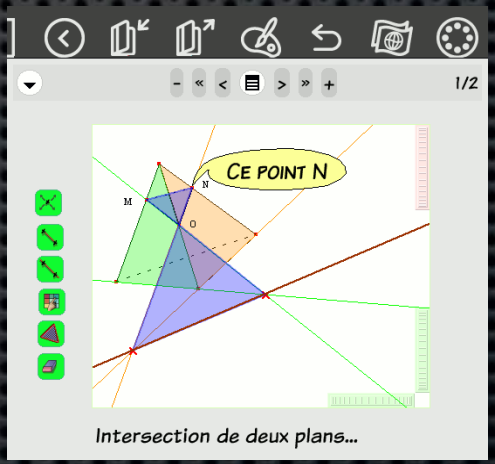
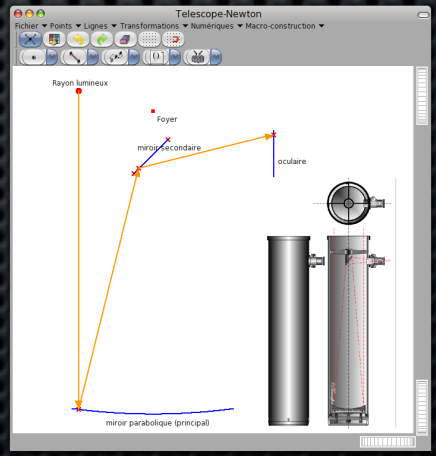
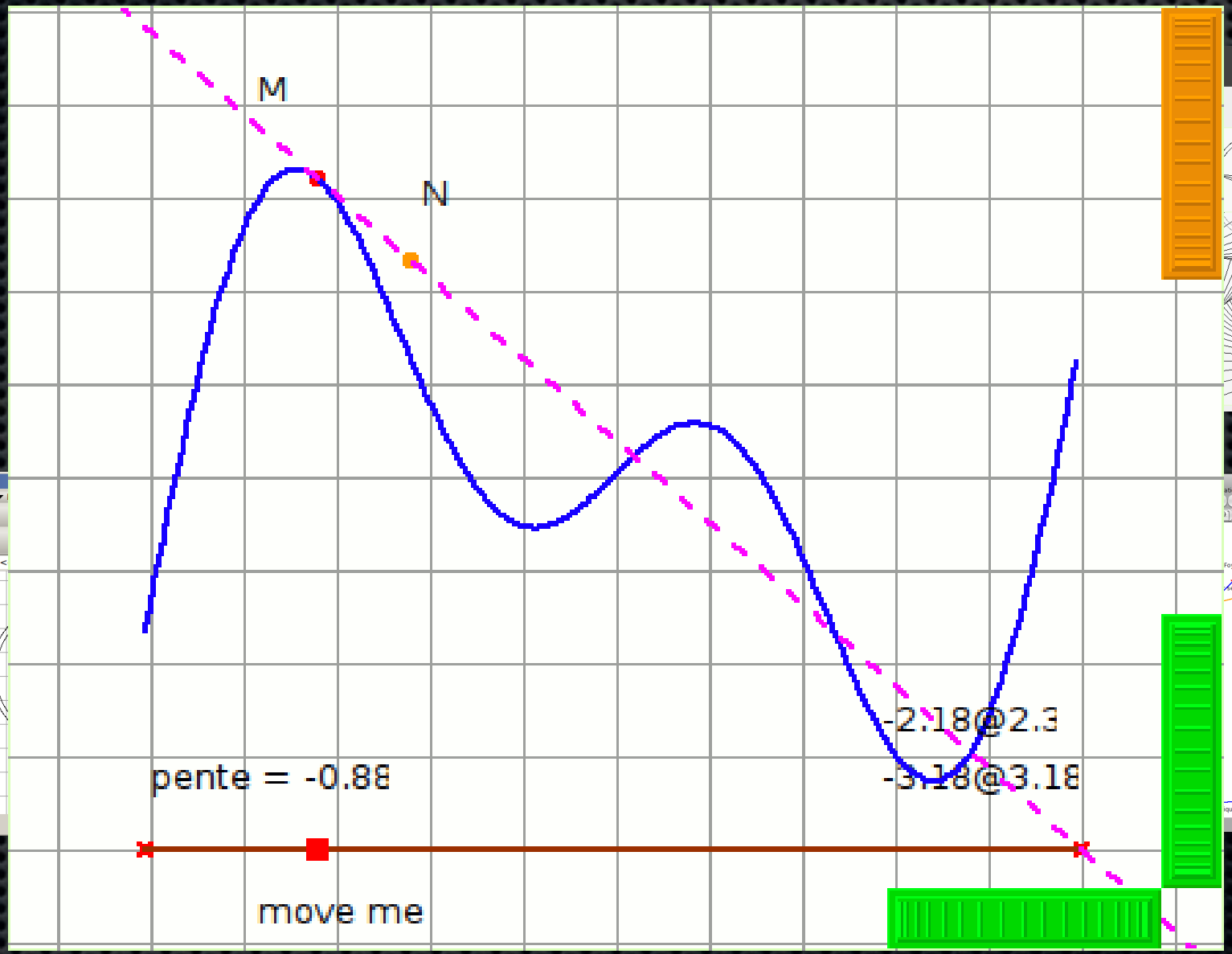
round

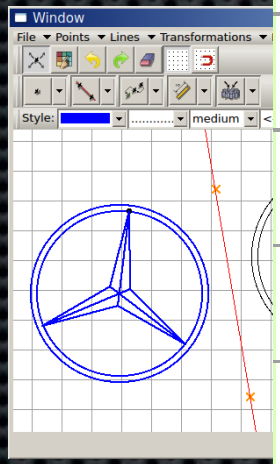

Window
Fichier Points Lignes Transformations Numériques Macro-construction
IA = 0.68
IB = 2.4
IM = 1.28
A
B
I

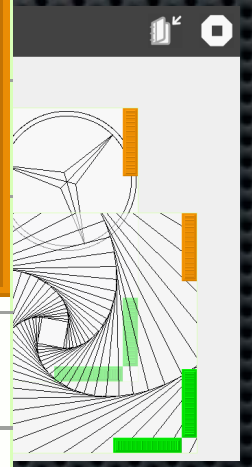

1/2
CE POINT N
M
N
O
Intersection de deux plans...

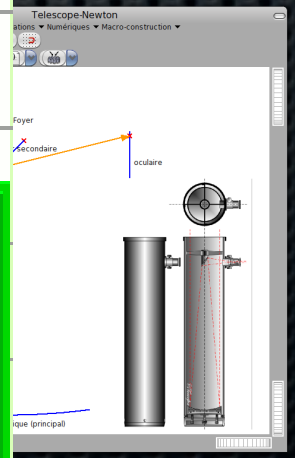

Telescope-Newton
Fichier Points Lignes Transformations Numériques Macro-construction
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

Zoom

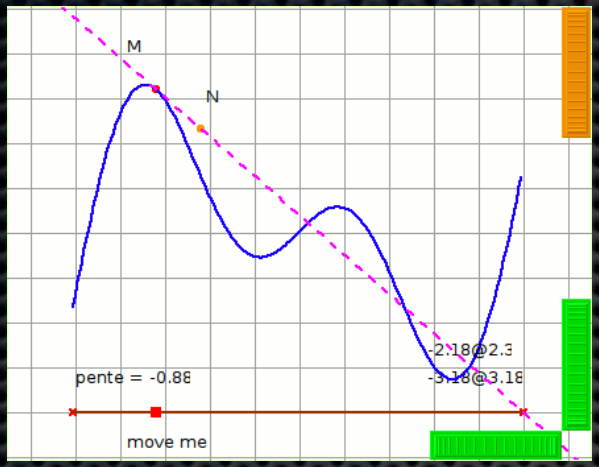

M
N
pente = -0.88
move me

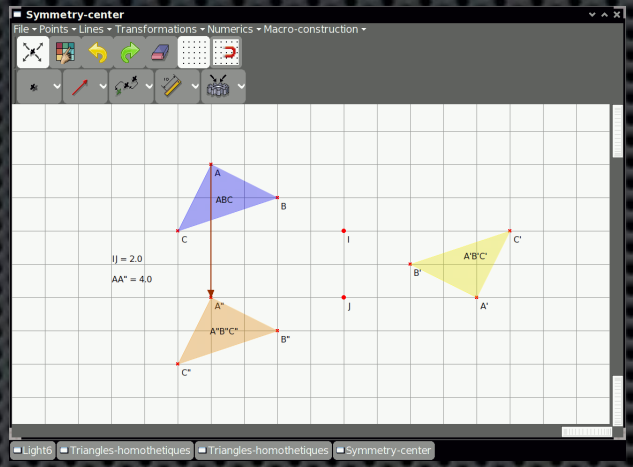

Window
File
Points
Lines
Transformations
Style:
medium

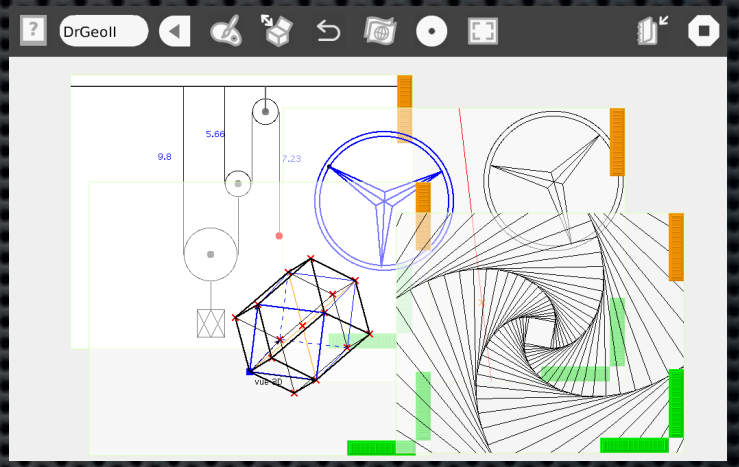


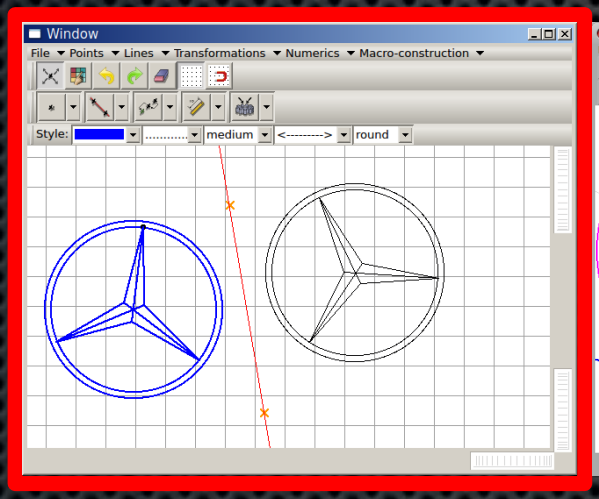

Telescope-Newton
Foyer
oculaire

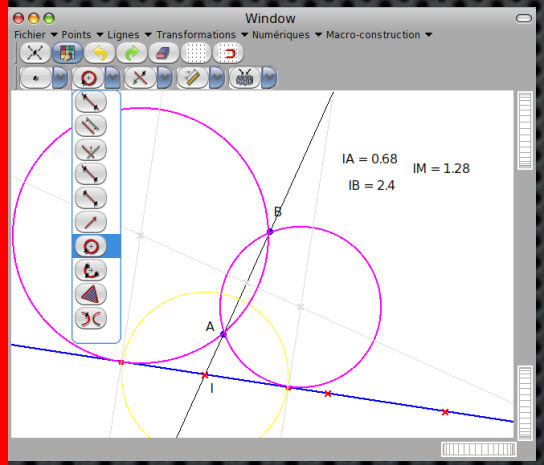
Des transformations

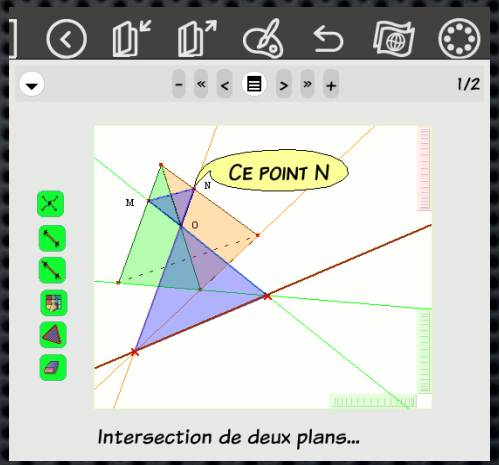


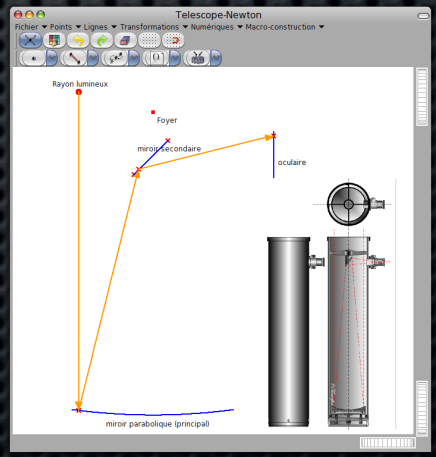




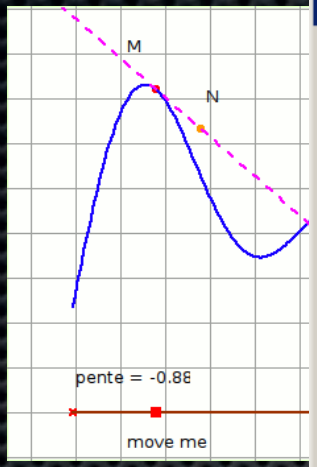


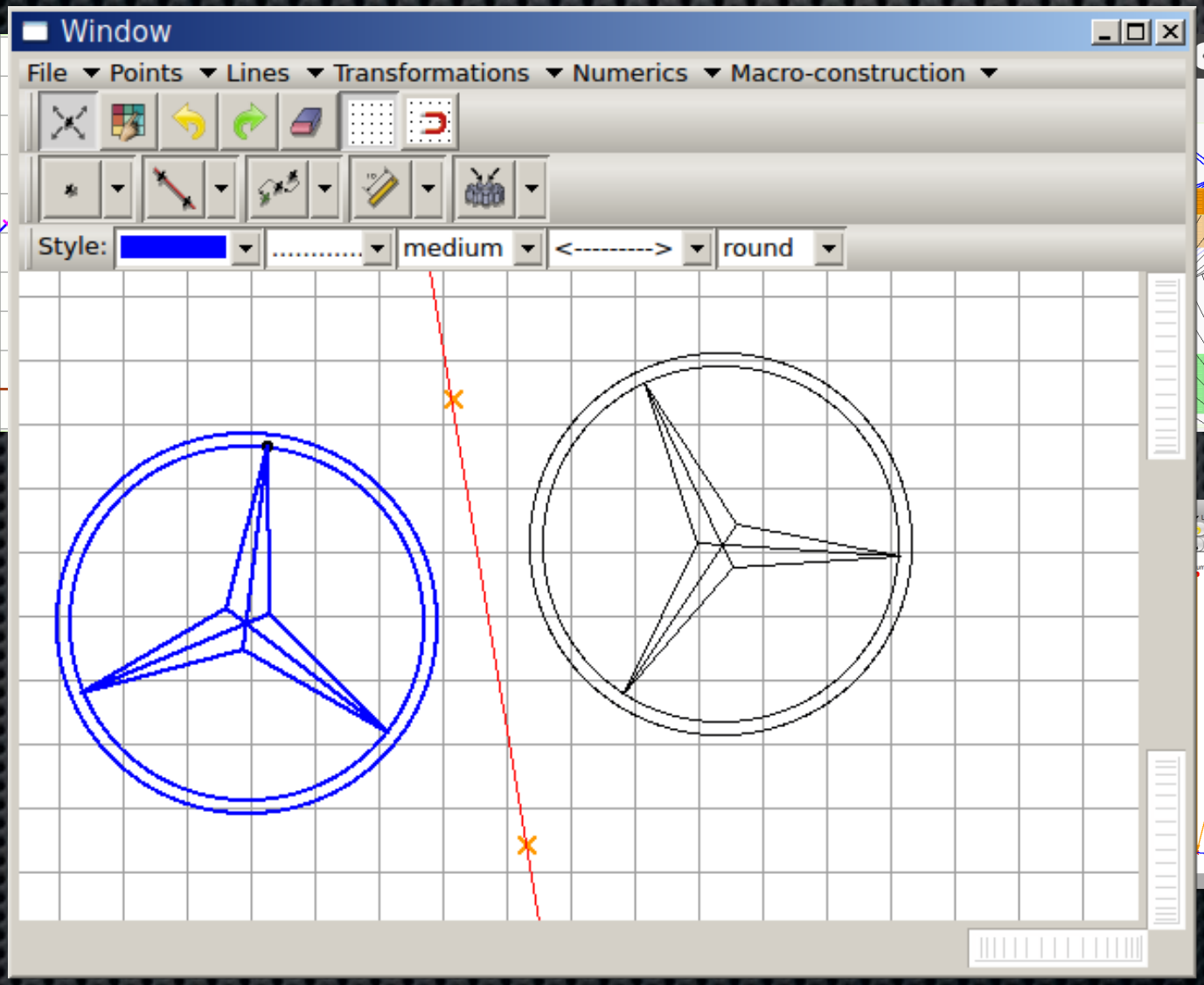






Zoom


M
N
pente = -0.88
move me


Window
File
Points
Lines
Transformations
Numerics
Macro-construction
Style:
medium
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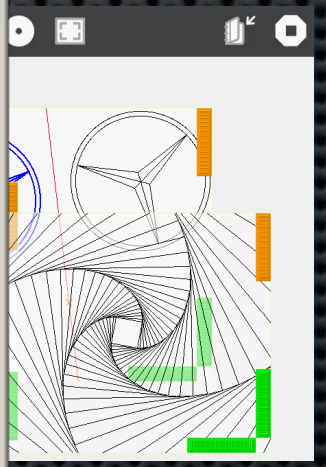
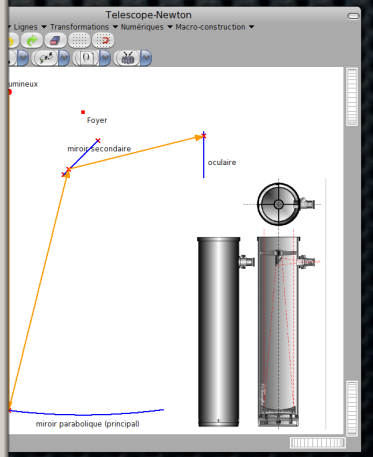
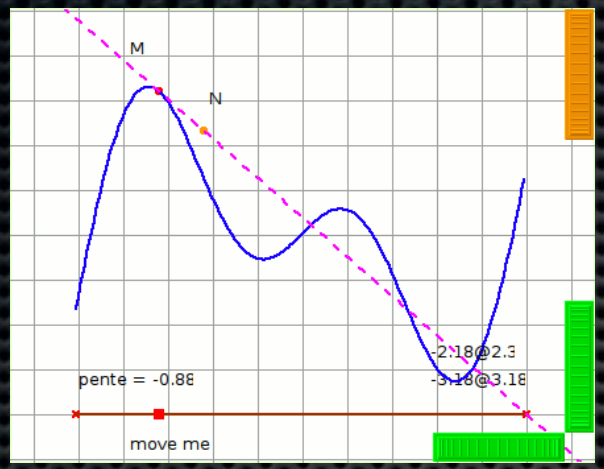
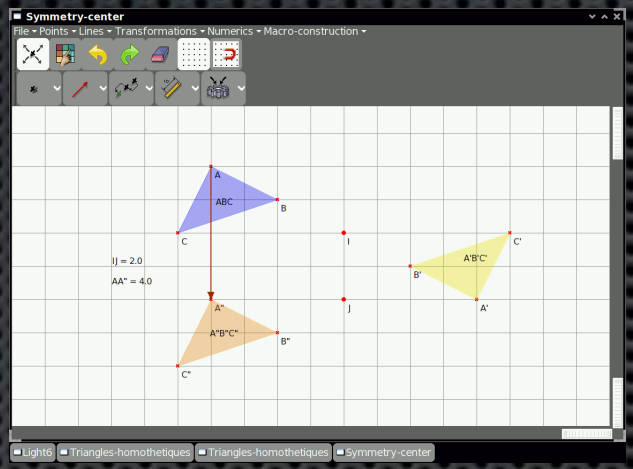
round

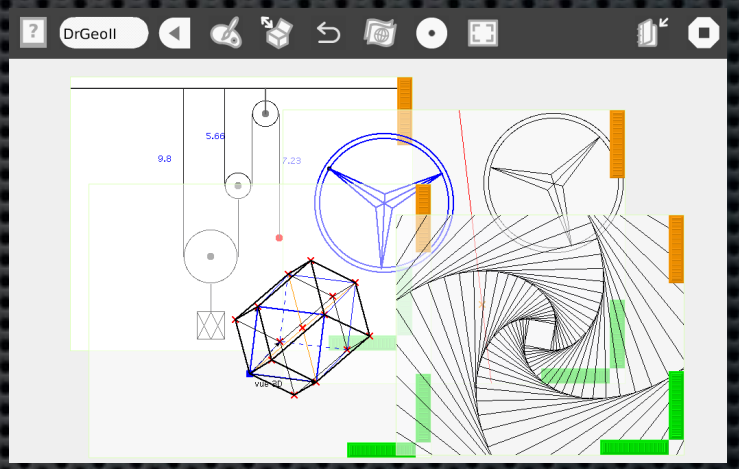


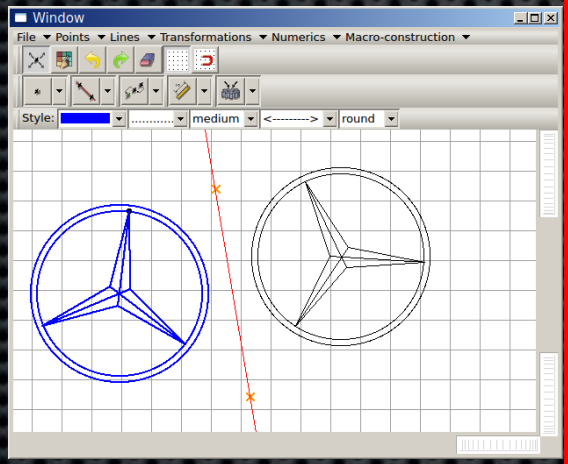

Telescope-Newton
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

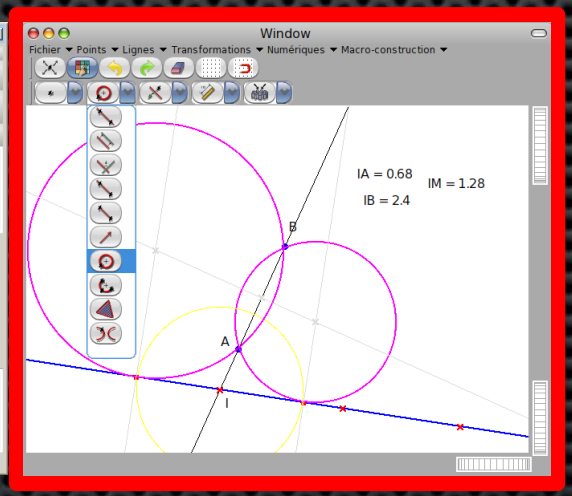
Scripts

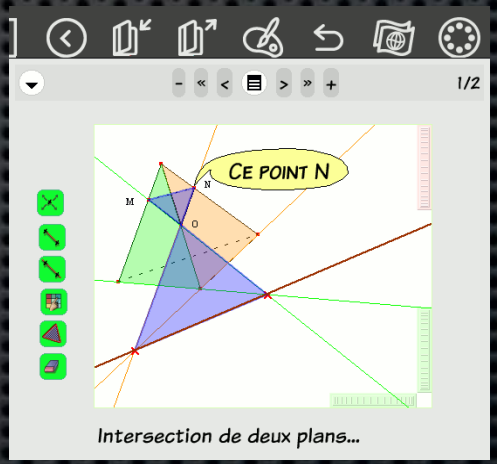

M
N
pente = -0.88
move me

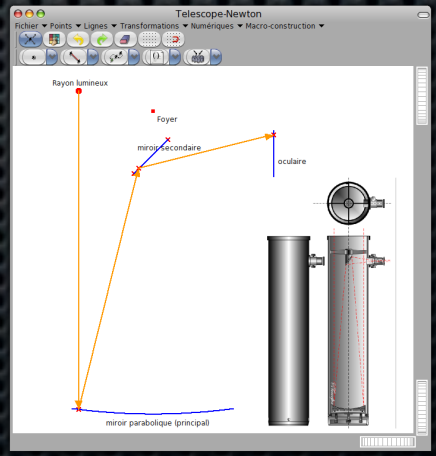

Symmetry-center
File Points Lines Transformations Numerics Macro-construction
ABC
A'B'C'
A"B"C"
IJ = 2.0
AA" = 4.0
Light6
Triangles-homothetiques
Triangles-homothetiques
Symmetry-center


DrGeoII

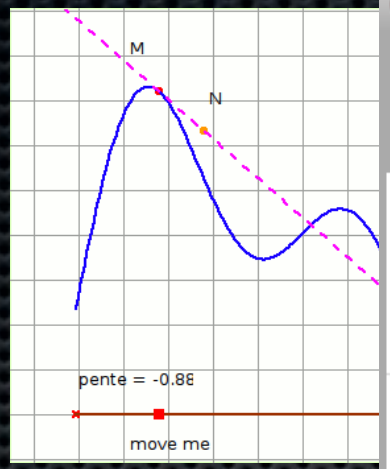

Window
File Points Lines Transformations Numerics Macro-construction
Style:
medium
round

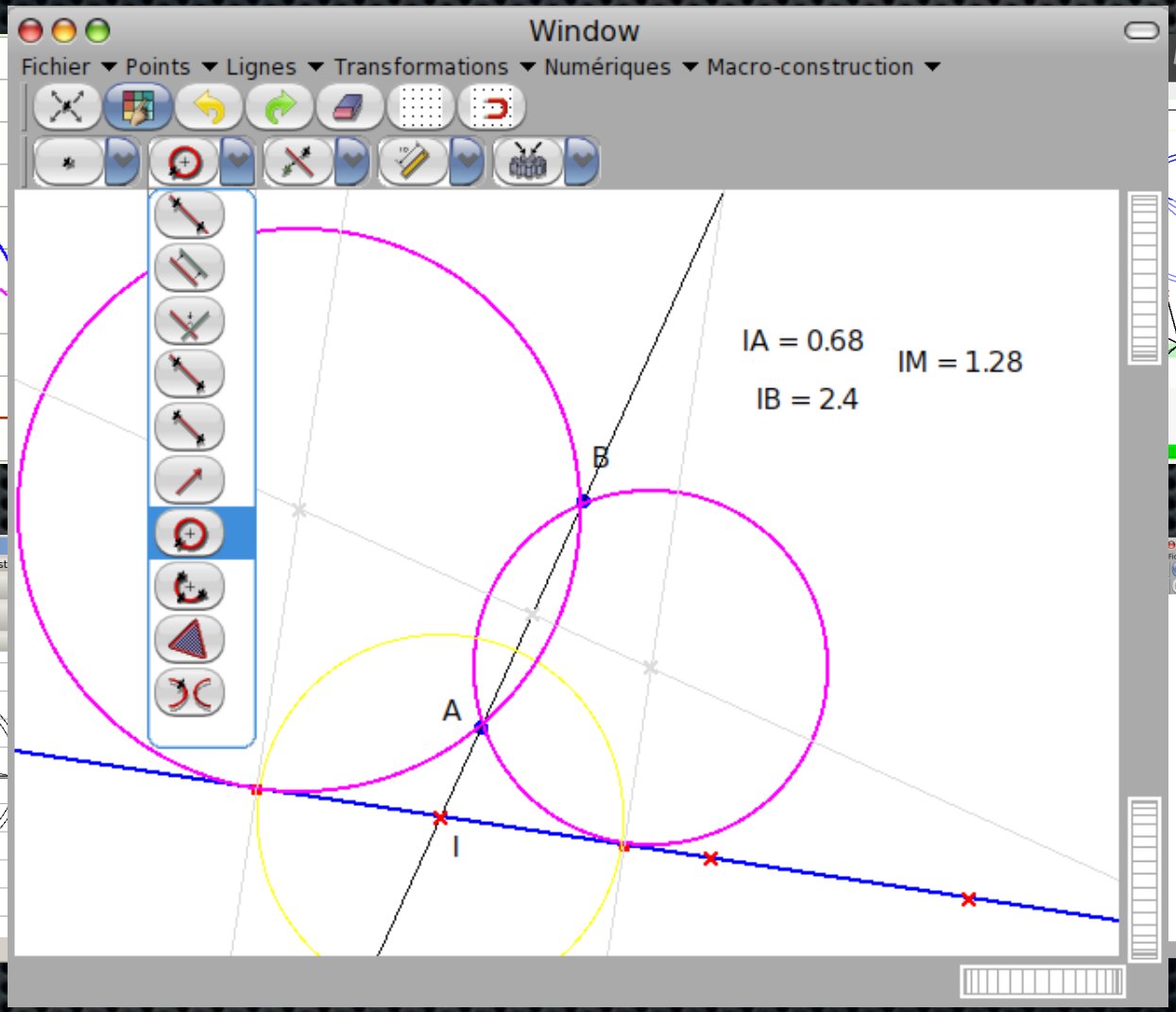

Window
Fichier Points Lignes Transformations Numériques Macro-construction
IA = 0.68
IB = 2.4
IM = 1.28
A
B
I

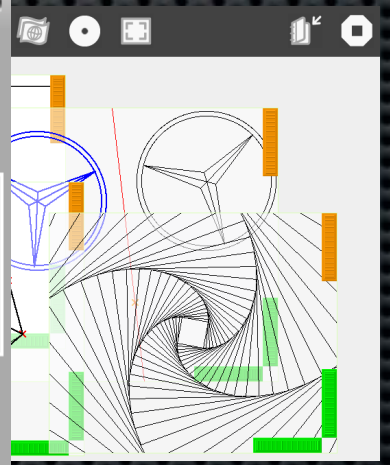

1/2
CE POINT N
M
N
O
Intersection de deux plans...

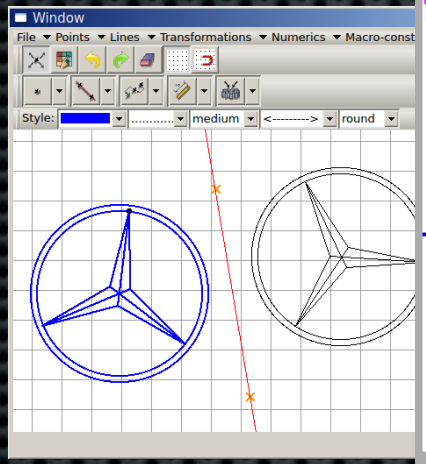

Telescope-Newton
Fichier Points Lignes Transformations Numériques Macro-construction
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

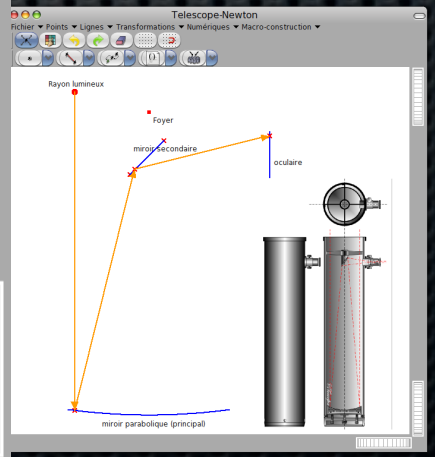
Zoom


M
N
pente = -0.88
move me

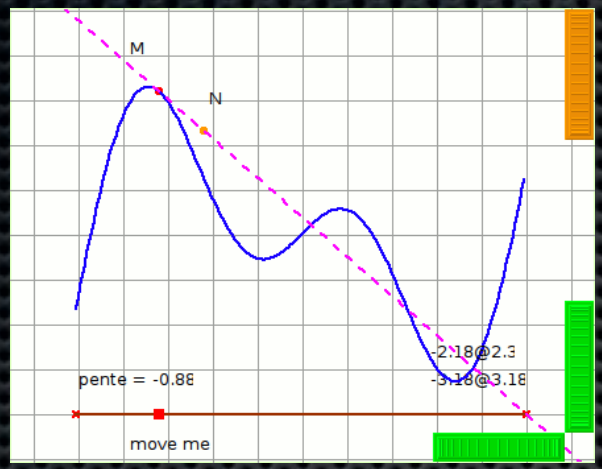

Window
Fichier
Points
Lignes
Transformations
Numériques
Macro-construction
IA = 0.68
IM = 1.28
IB = 2.4
B
A
I

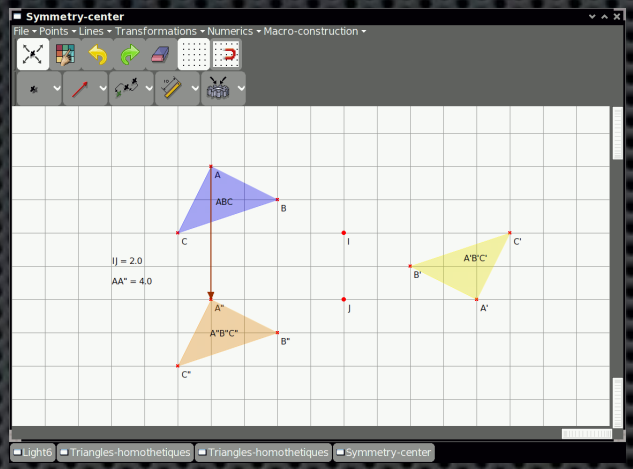


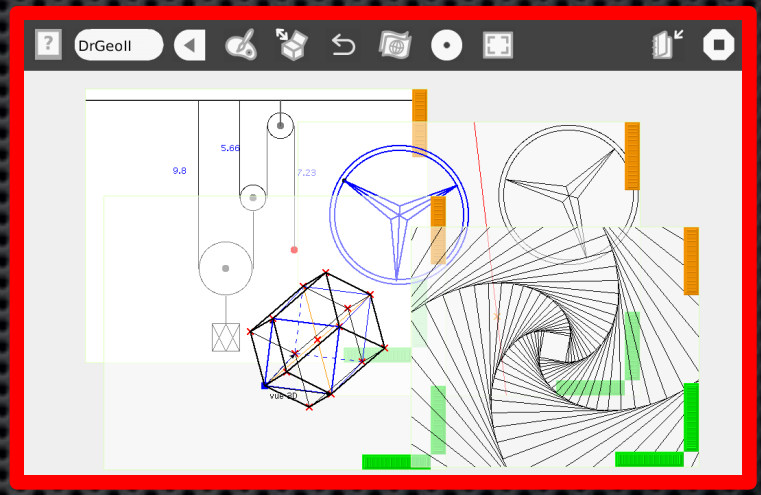

Window
File
Points
Lines
Transformations
Numerics
Macro-const
Style:
medium
round

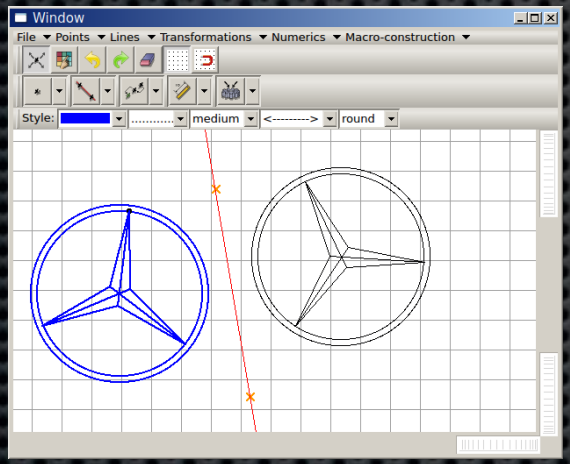

Telescope-Newton
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

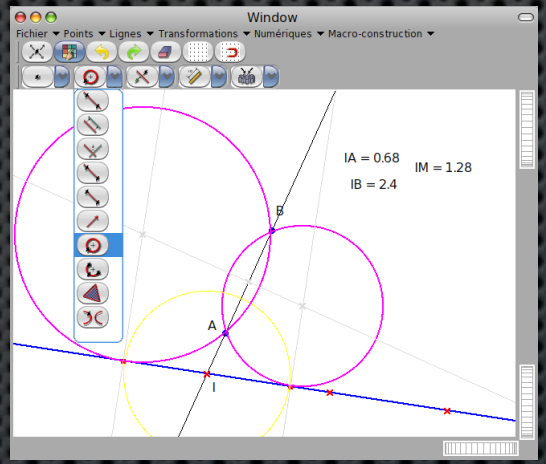
Various

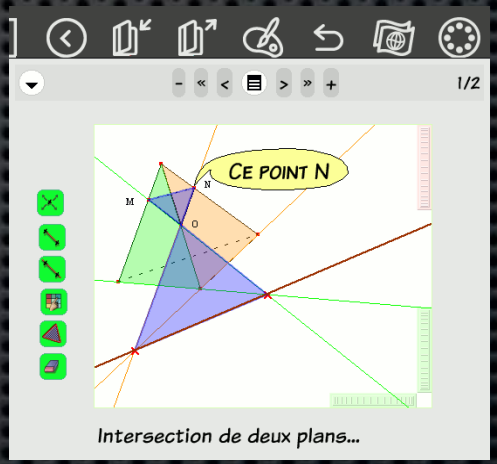

M
N
pente = -0.88
move me

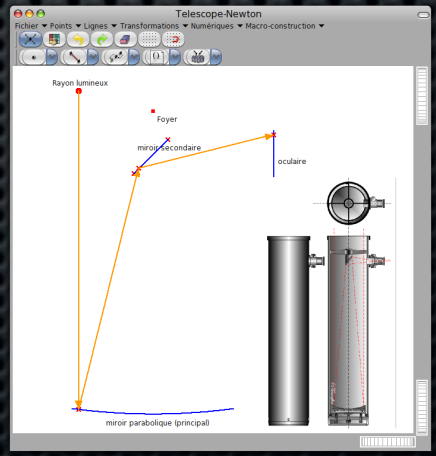

Symmetry-center
File Points Lines Transformations Numerics Macro-construction
ABC
A'B'C'
A"B"C"
IJ = 2.0
AA" = 4.0
Light6
Triangles-homothetiques
Triangles-homothetiques
Symmetry-center


DrGeoII

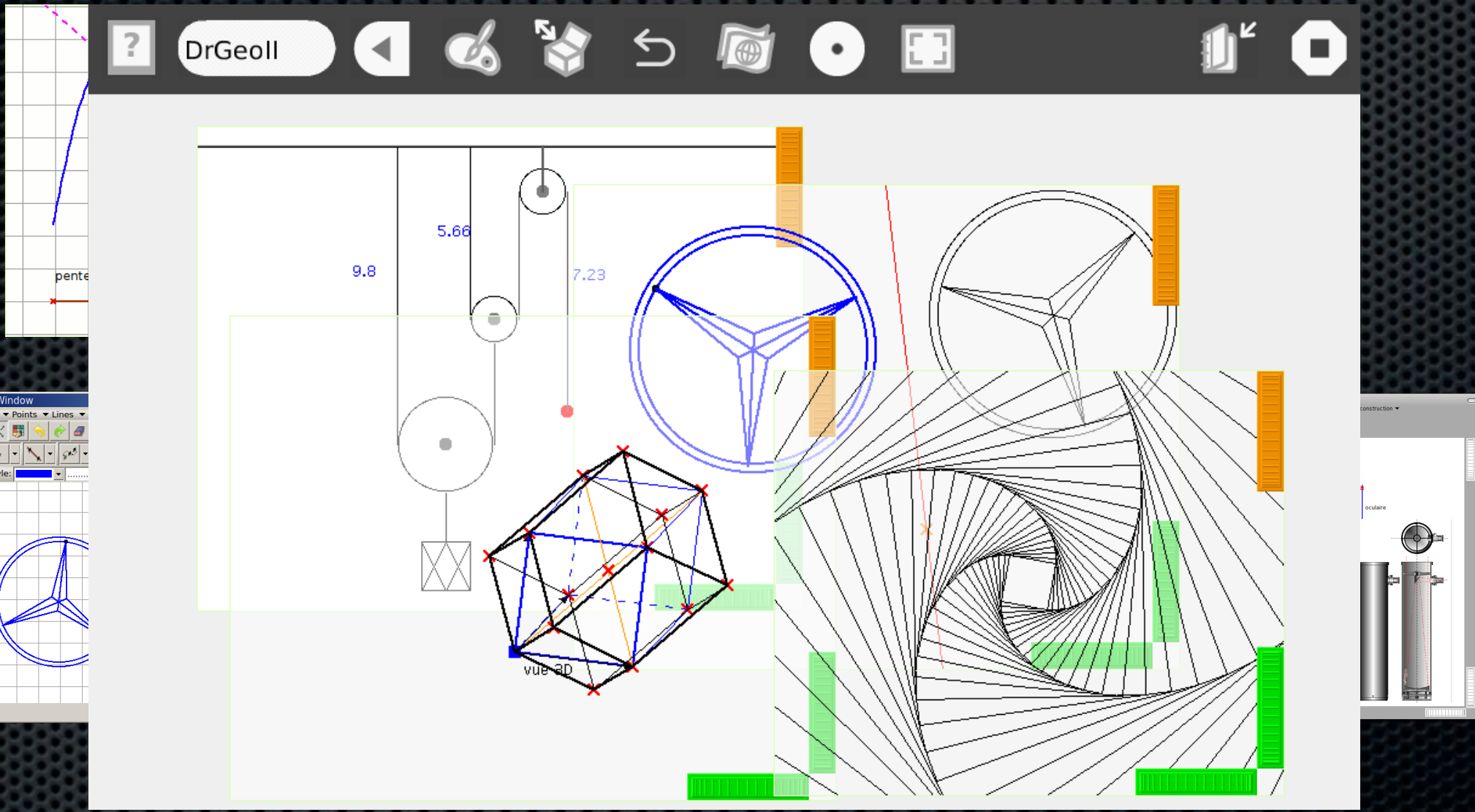

Window
File Points Lines Transformations Numerics Macro-construction
Style:
medium
round


Window
Fichier Points Lignes Transformations Numériques Macro-construction
IA = 0.68
IB = 2.4
IM = 1.28
A
B
I

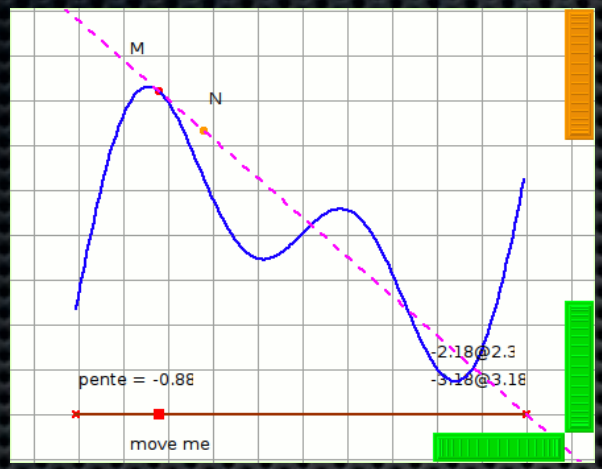

1/2
CE POINT N
M
N
O
Intersection de deux plans...

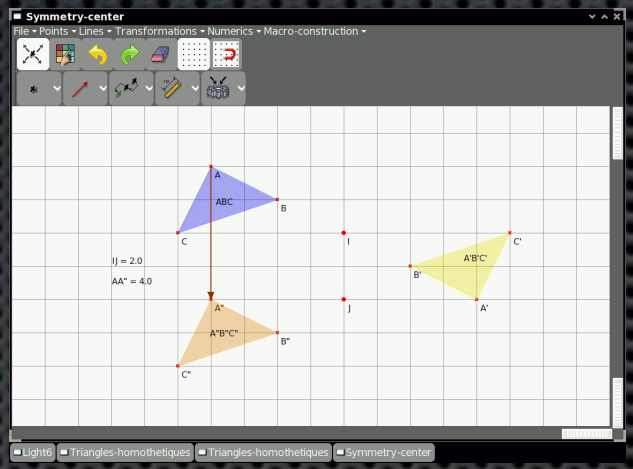

Telescope-Newton
Fichier Points Lignes Transformations Numériques Macro-construction
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

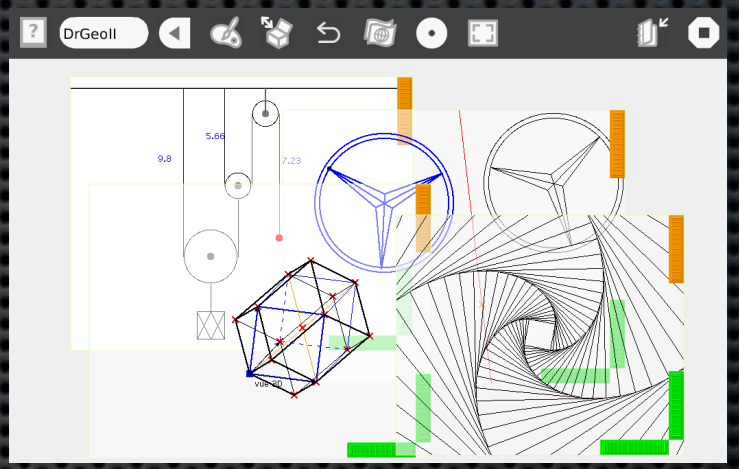
Zoom

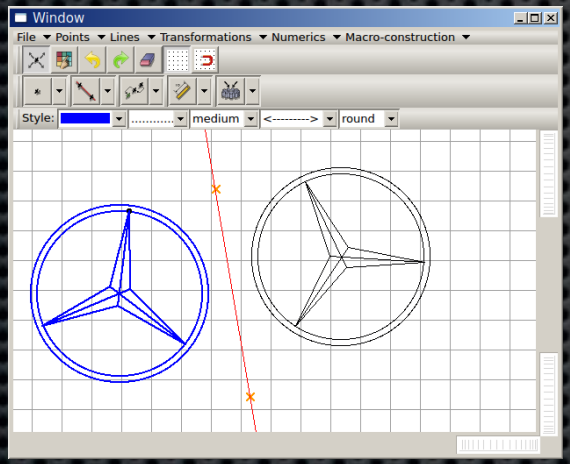


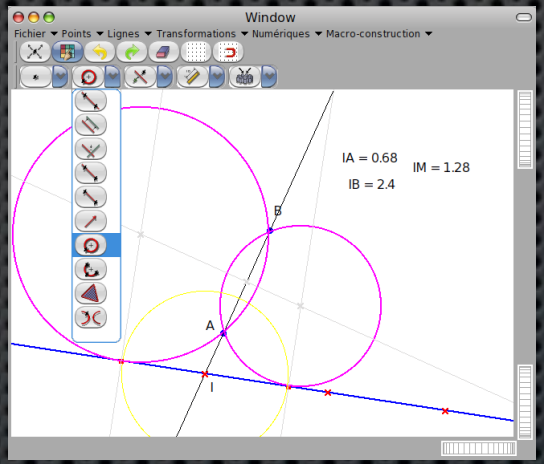
Interactive Book/Etoys

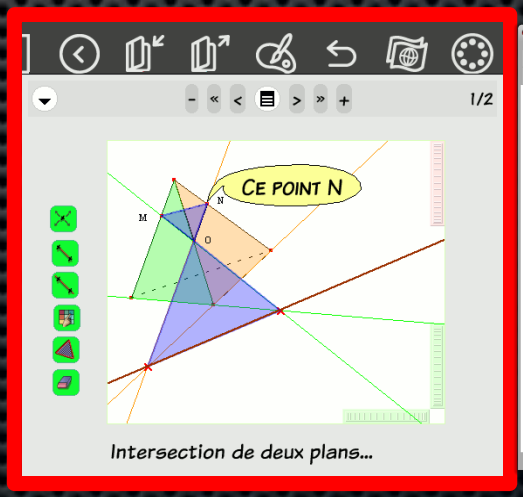


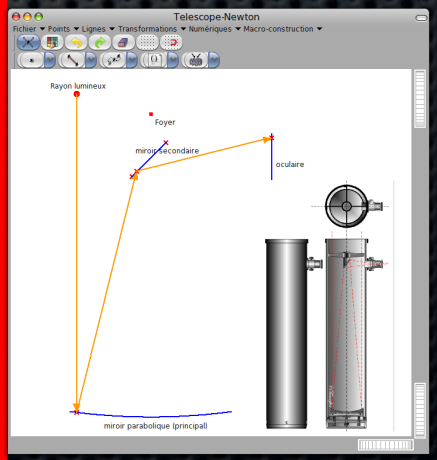




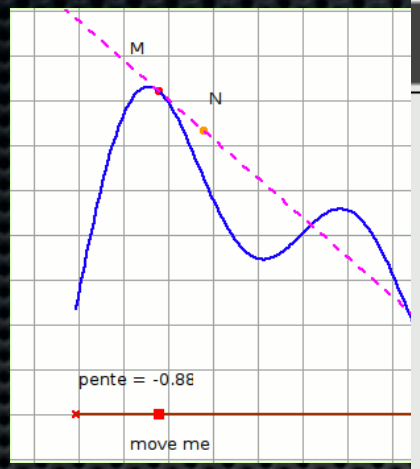


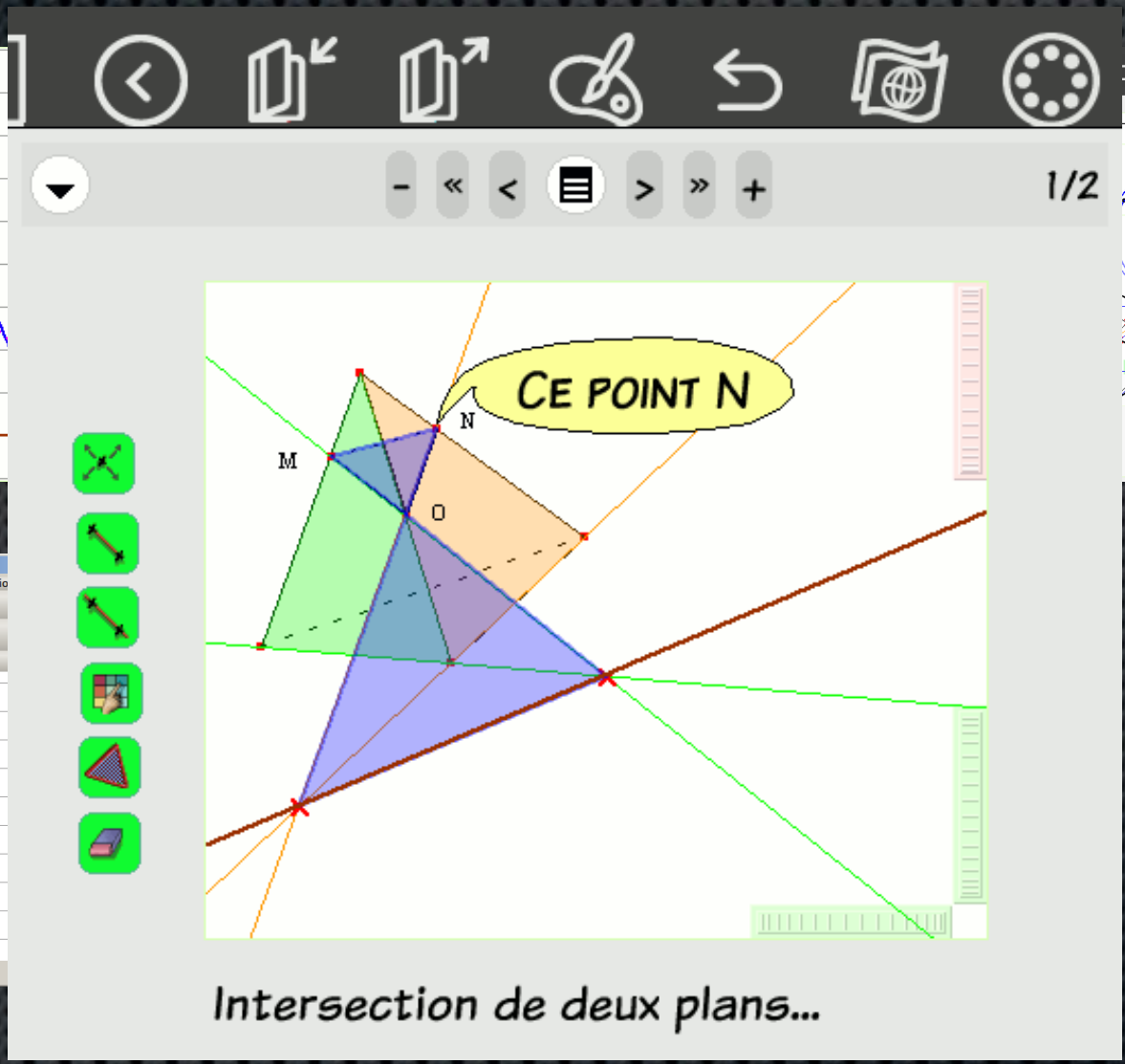


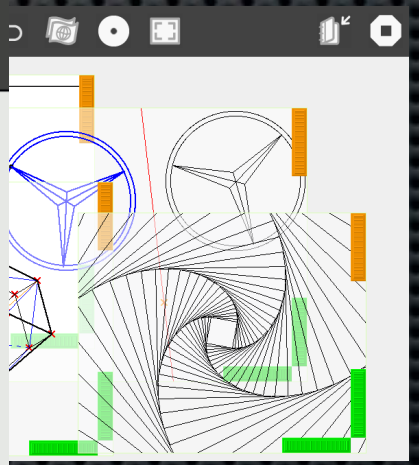


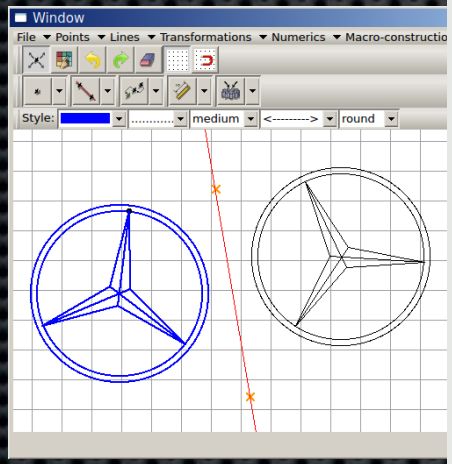


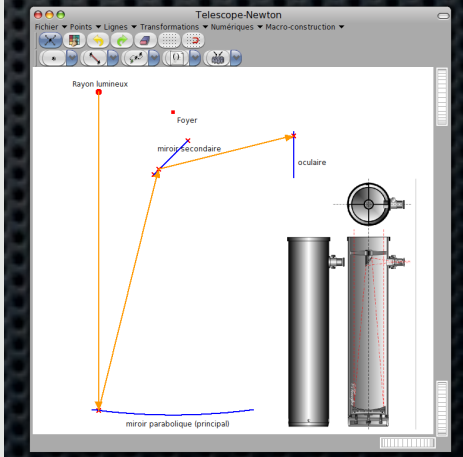
Zoom


M
N
pente = -0.88
move me

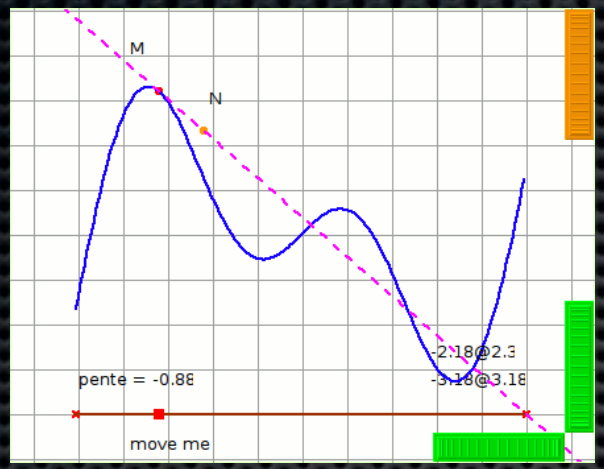

1/2
CE POINT N
N
M
O
Intersection de deux plans...

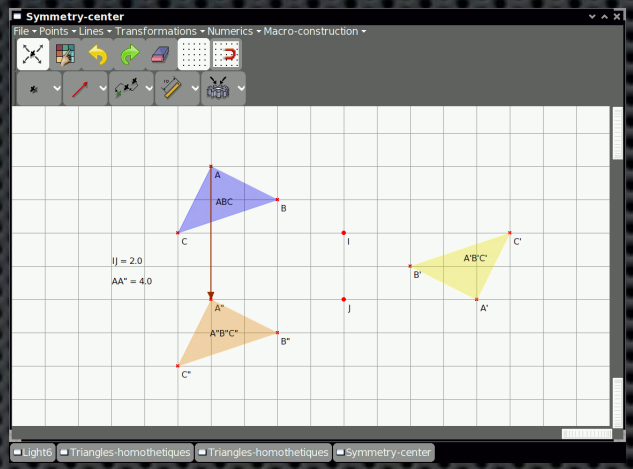


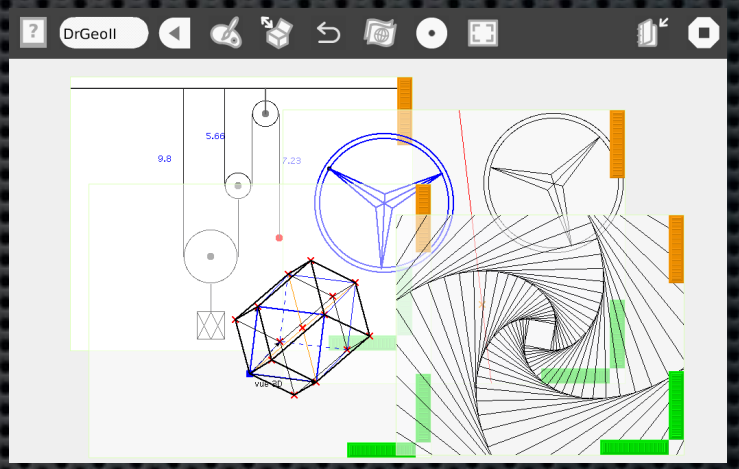

Window
File
Points
Lines
Transformations
Numerics
Macro-constructio
Style:
medium
round

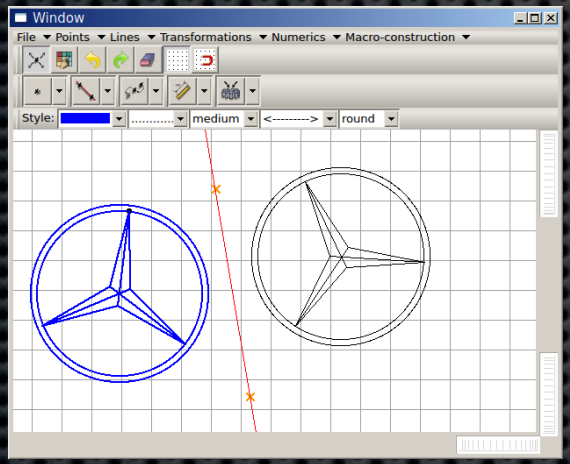

Telescope-Newton
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

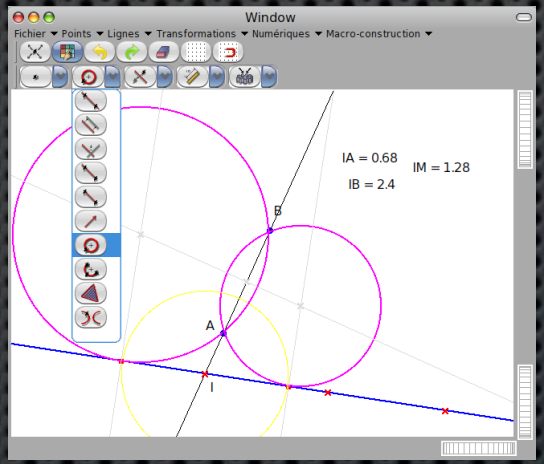
Physics

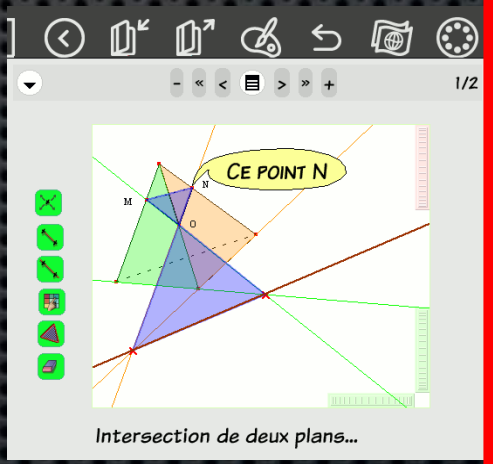

M
N
pente = -0.88
move me

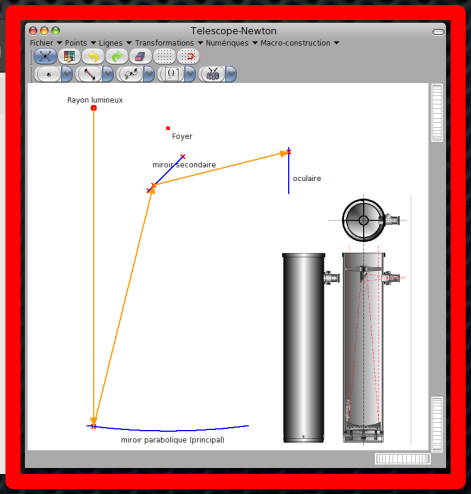

Symmetry-center
File Points Lines Transformations Numerics Macro-construction
ABC
A'B'C'
A"B"C"
IJ = 2.0
AA" = 4.0
Light6
Triangles-homothetiques
Triangles-homothetiques
Symmetry-center


DrGeoII

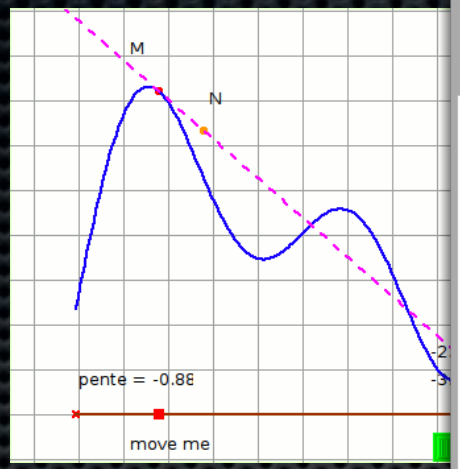

Window
File Points Lines Transformations Numerics Macro-construction
Style:
medium
round

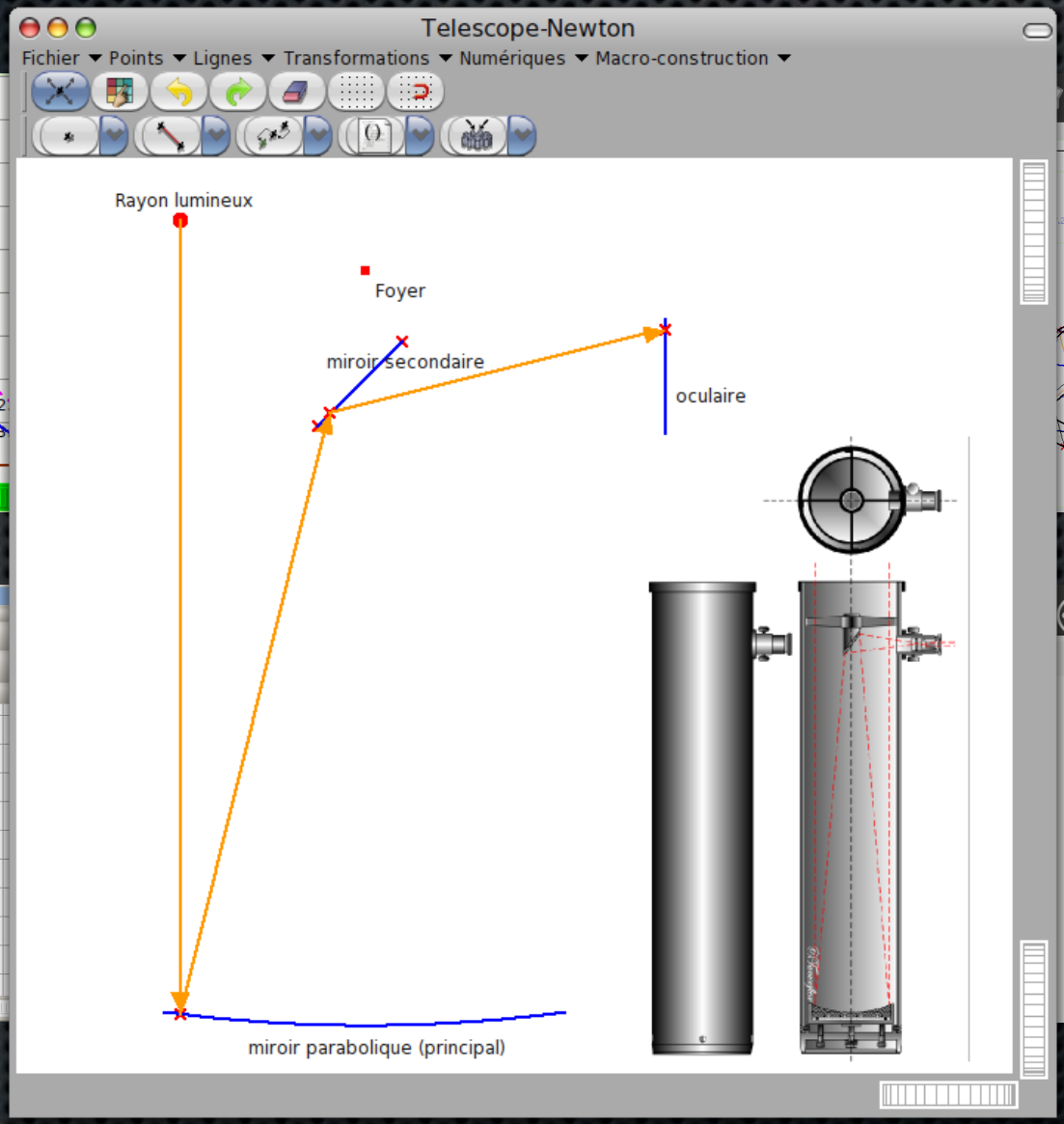

Window
Fichier Points Lignes Transformations Numériques Macro-construction
IA = 0.68
IB = 2.4
IM = 1.28
A
B
I

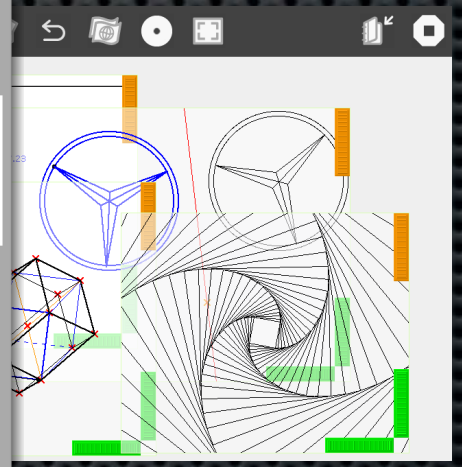

1/2
CE POINT N
M
N
O
Intersection de deux plans...

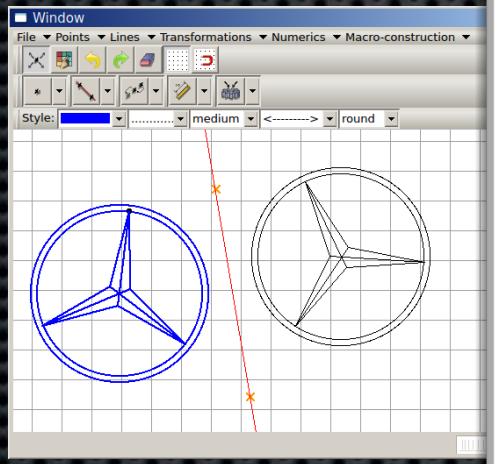

Telescope-Newton
Fichier Points Lignes Transformations Numériques Macro-construction
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)

Zoom


M
N
pente = -0.88
move me


Telescope-Newton
Fichier
Points
Lignes
Transformations
Numériques
Macro-construction
Rayon lumineux
Foyer
miroir secondaire
oculaire
miroir parabolique (principal)




Window
File
Points
Lines
Transformations
Numerics
Macro-construction
Style:
medium
round

1/2

Interactive Geometry

It's

Dynamic!

Demonstrations...

Technical

Dr. Geo written

with

Pharo Smalltalk

Why Pharo Smalltalk ?

- Portability : Linux, Mac, Windows, Android, iOS
- Boost on productivity
- Comfort of the programming environment
- Dr. Geo is *modify-me-ready*!

Dr. Geo Smalltalk Script

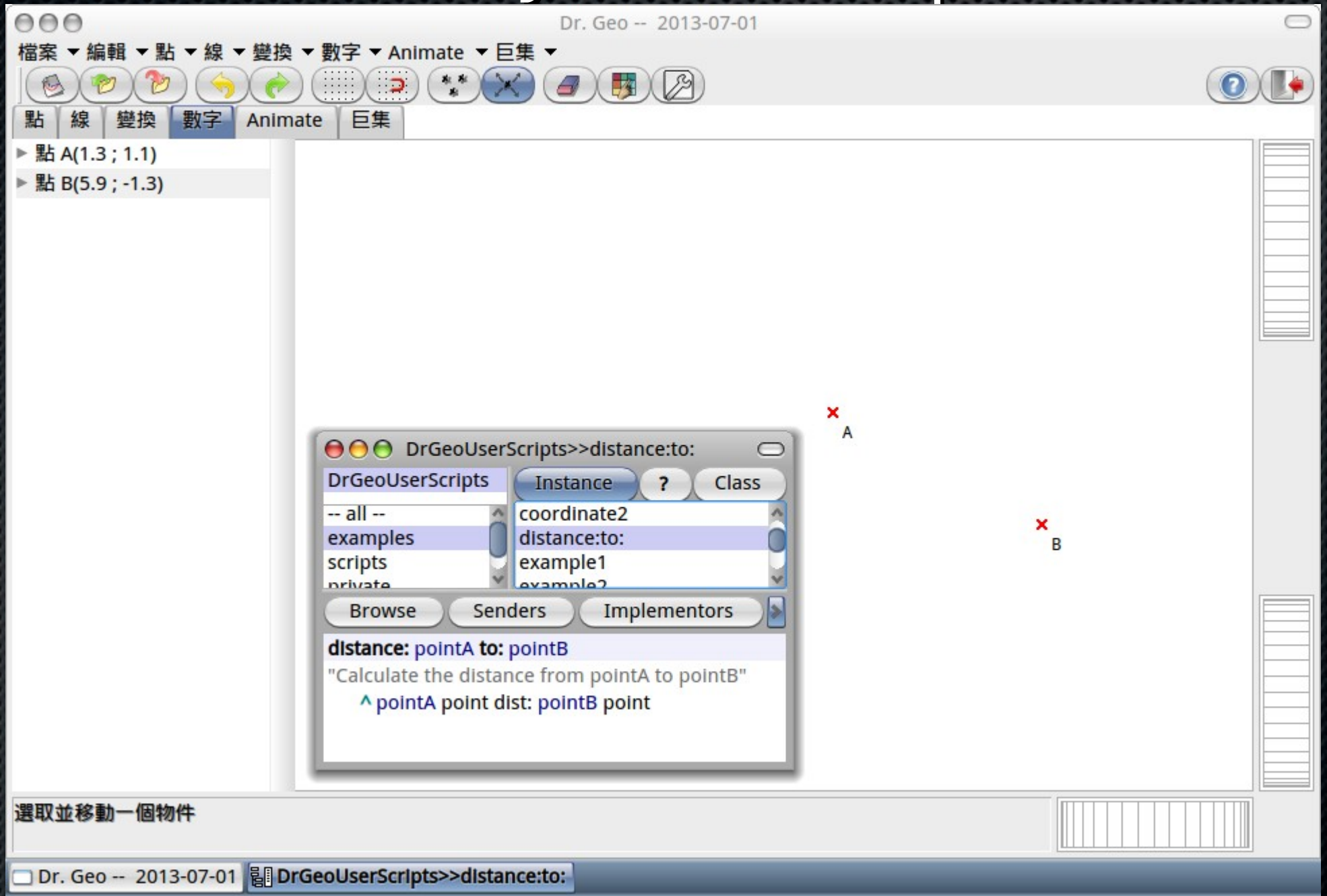
EMPOWERING THE USER

Inserting Code Snippet

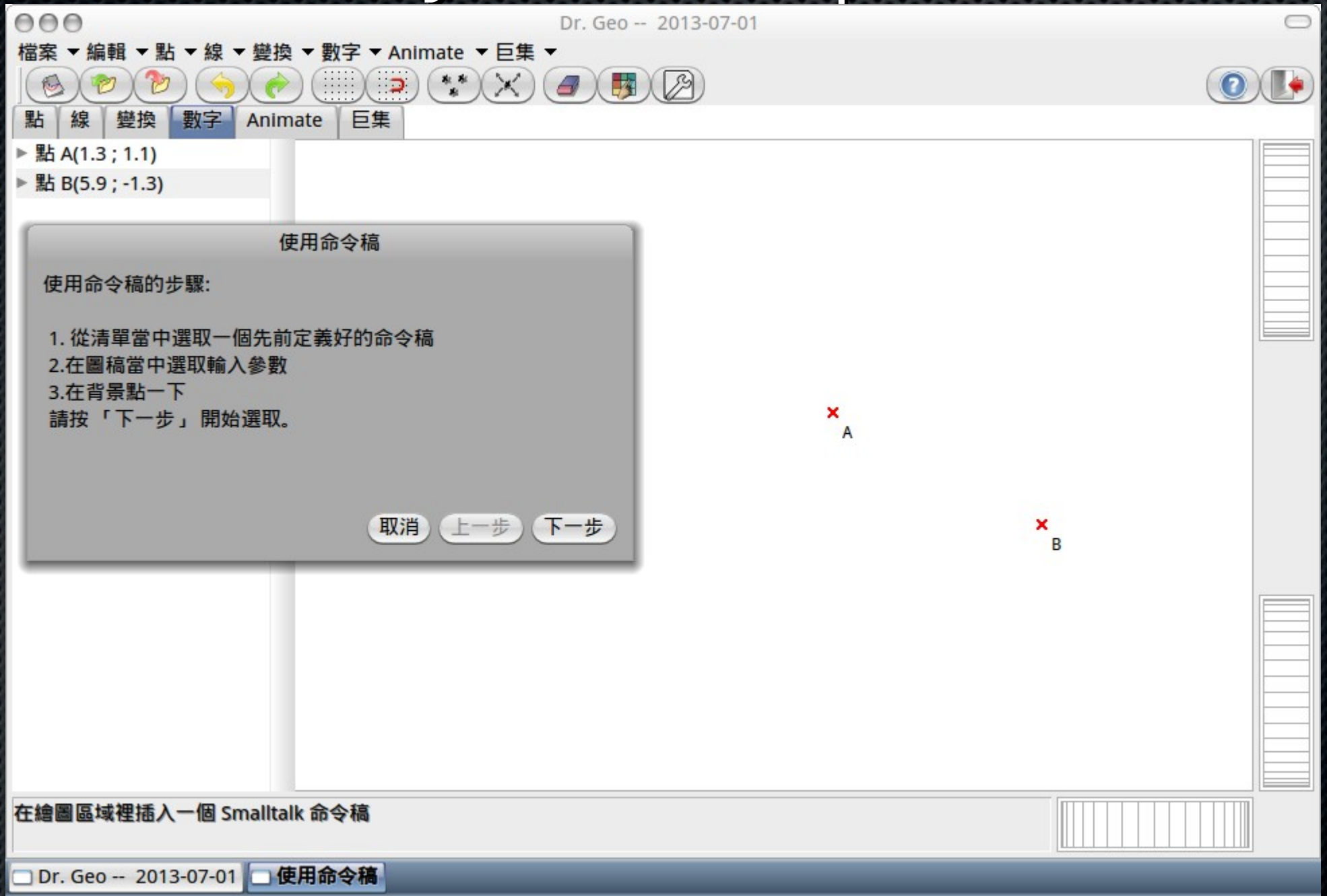
Scripts:

Mathematical objects you pin in your sketch as points, lines,...

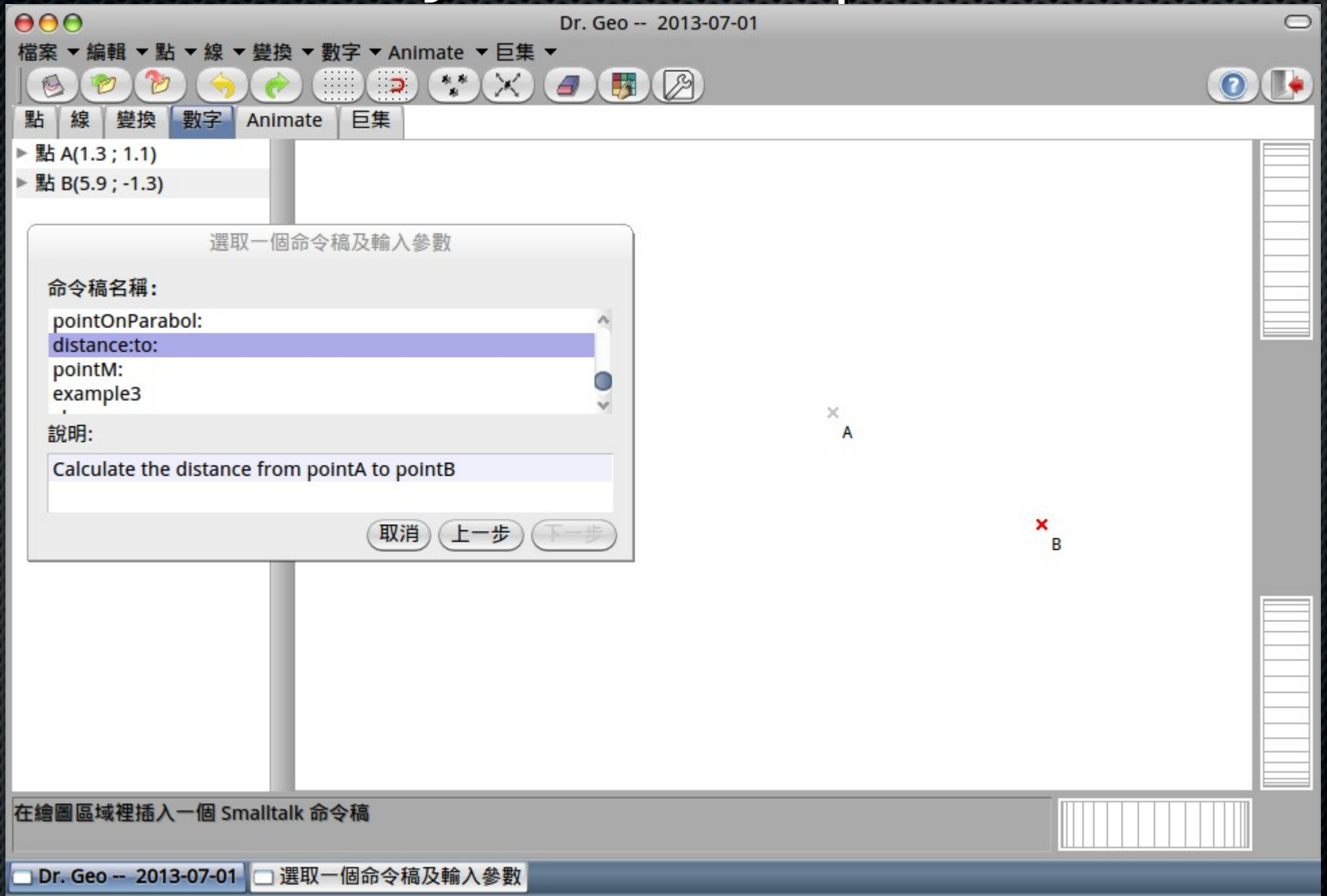
Edit your Script



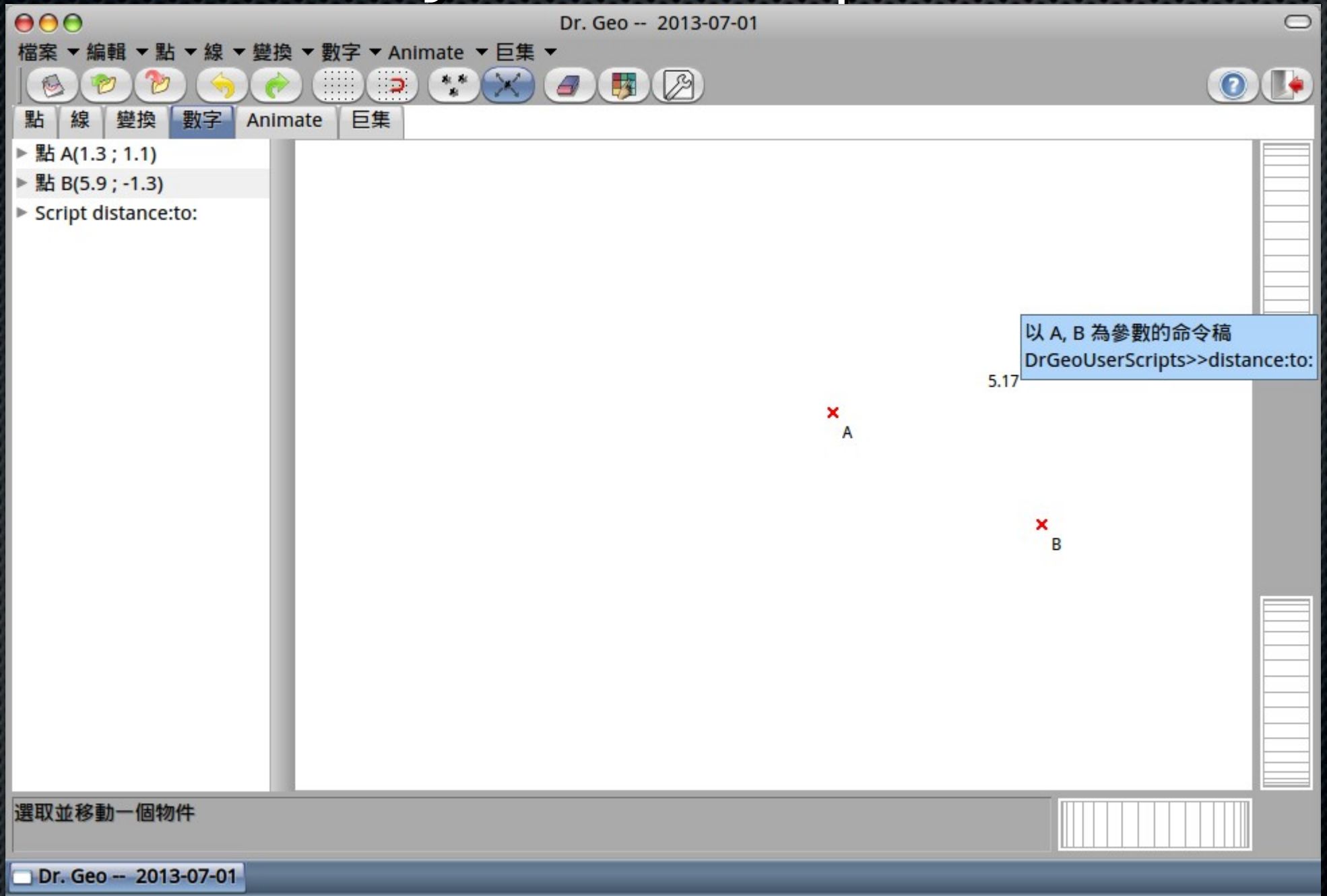
Use your Script 1/3



Use your Script 2/3



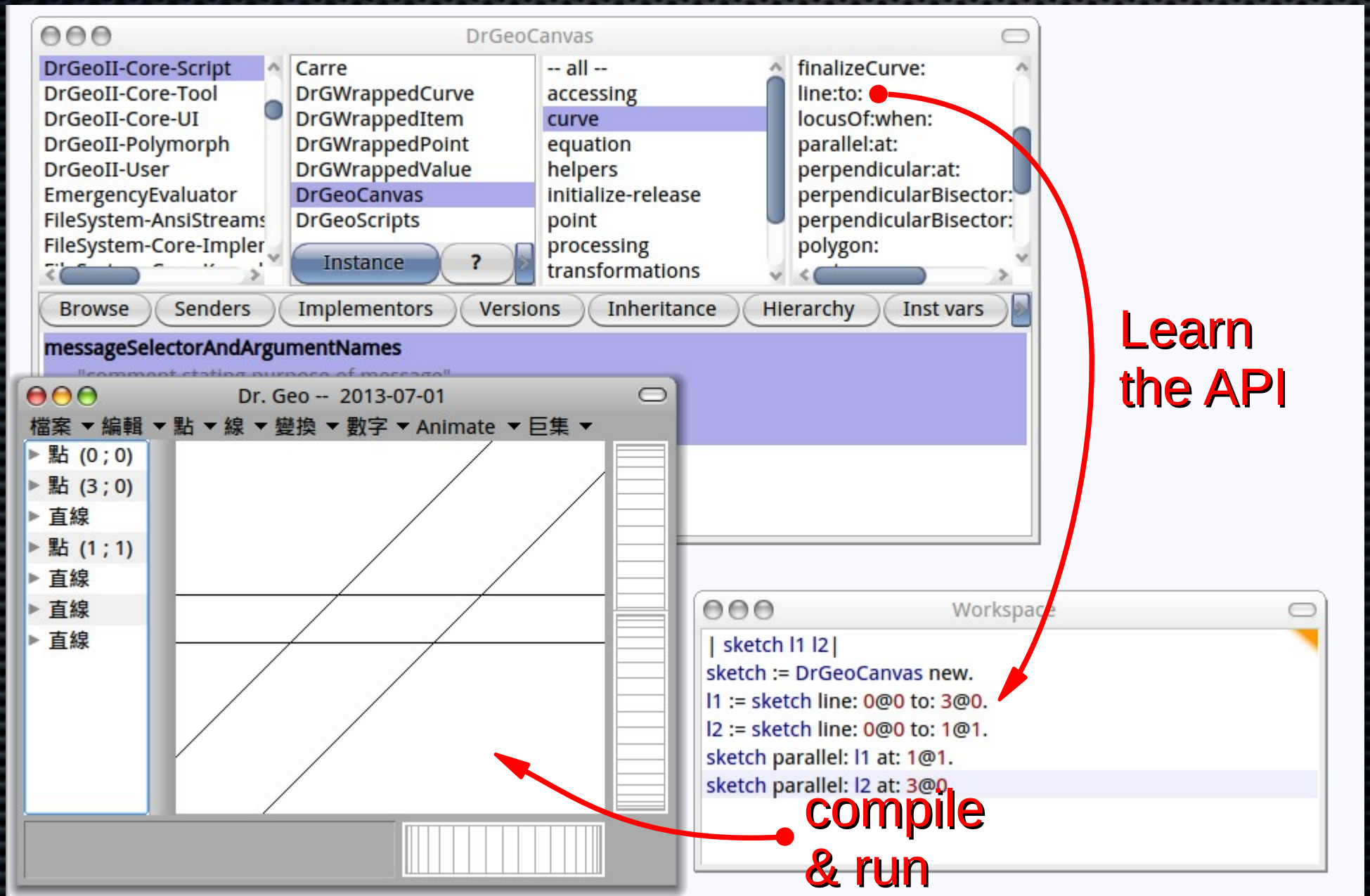
Use your Script 3/3



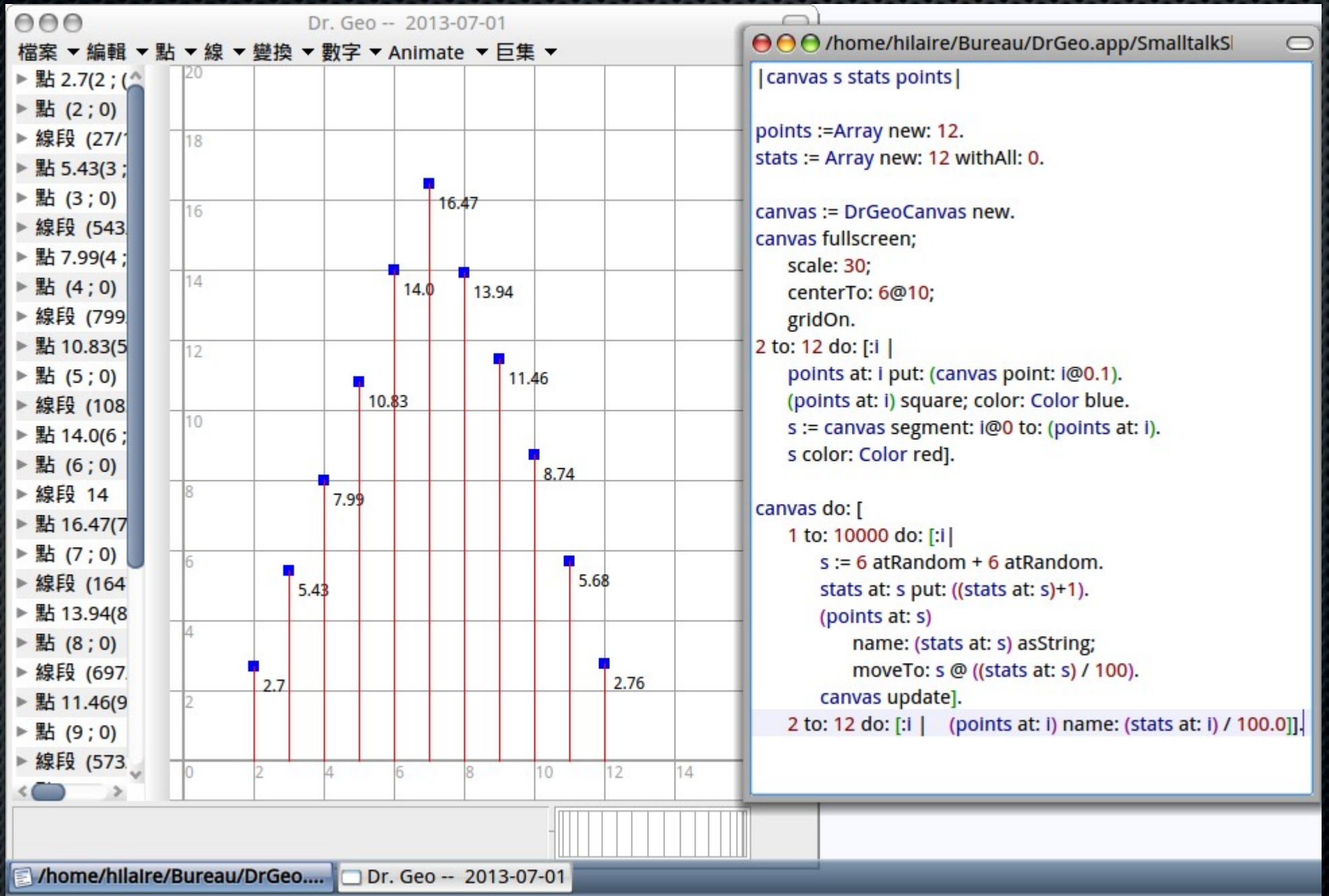
Smalltalk programmed interactive sketches

- API-easy thanks to Smalltalk
- Nice written sketches
- The power of code bloc

Smalltalk sketch: Workflow



Smalltalk sketch animated



Boost your Creativity

NOW, imagine it

for your software project