

User guide to the java applet **Compoly** for learning descriptive geometry
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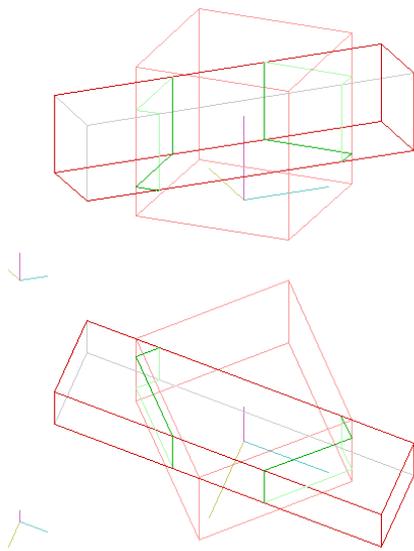
After starting: the actual model is a cube defined by the data in the left-hand side menu (see help).
The composition of the polyhedrons is empty.

Transformations: the commands *r+* and *r-* rotate the actual model around the specified coordinate axis;
m+ and *m-* (move) define translation, *+**s* and *-s* define stretching/compressing.

Changing the direction of projection: the commands *left*, *right*, *up*, *down* in the menu *project from*
rotate the direction of projection, *top/front* draws top view (below) and front view (above).

Transformations in the projection: the commands in the menu *picture transform* act on the screen;
reset regenerates the original dimensions of the picture.

1. problem



Put the cube defined in its original position (*top/front*,
reset, *def*) into the composition (*merge*).

Make a prism from the cube by transformations:

Rotate around the cube into a parallel position to the
coordinate axes (*r+* 3-times). Watch the line of
intersection on the actual model built with the
components in the composition.

Change the direction of projection, then *top/front*.

Compress the actual model in the direction of *z*
(*-s* 4-times) and in the *x*-direction (*-s* 4-times), stretch it
in *y*-direction (*+**s* 5-times).

Change the position of the prism:

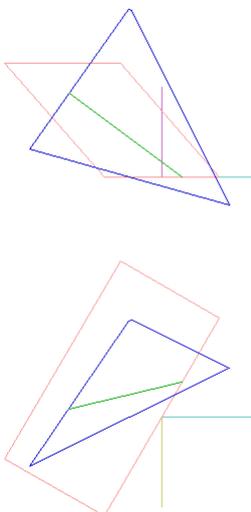
Move it upwards in *z*-direction (*m+* into the middle) and
in *x*-direction (*m+* into a symmetric position), watch the
line of intersection with the cube on the surface of the
prism.

Change the direction of projection.

Put the prism into the composition (*merge*), then change the option *mode=draw* into *paint*.

The front view of the composition will appear. Look the central projection through red-green
glasses by choosing the option *draw=centr*. You will see the composition in 3D.

2. problem



Delete the data structure of the composition (*new comp*) and
also the actual model (*clear*).

The new actual model is a square. Change the number of sides
into 2, then press *def*. (This is the axial section of the cube in
the *xz*-plane.)

Rotate it around *x* (*r+* 3-times), then around *z* (*r-* 2-times).

Put it into the composition (*merge*).

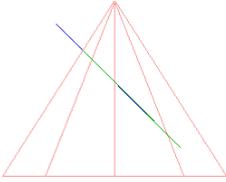
Define a triangle: the number of sides = 2, lower radius1= 7.1,
upper radius2= 0.1, height= 12, color= 3, press *def*.

Rotate it around *z* (*r-* 4-times), around *y* (*r-* 2-times),

Move it along *y* (*m-* 3-times), then *merge*.

Generate different projections with the options (*paint*) and
(*centr*), change the direction of projection, transform also the
picture.

3. problem



Pyramid:

The number of sides= 5, lower radius1= 8, radius2= 0.1, height=12, color= 2, *def, merge*.

Trapezoid:

The number of sides= 2, radius1= 4, radius2= 6, height= 12, color= 3, *def*.

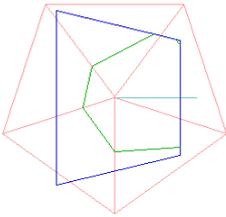
Rotate around x (r+ 3-times), move along y (m+ 8-times), move along z (m+ 3-times)

Change the direction of projection!

The line of intersection is shown on the actual model.

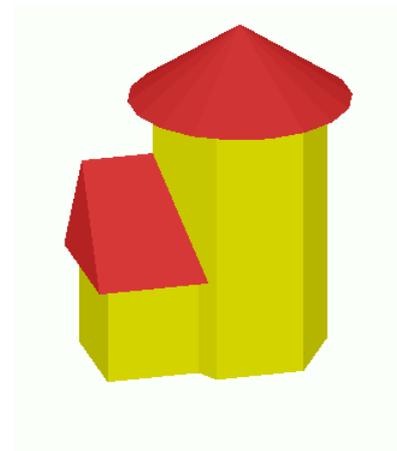
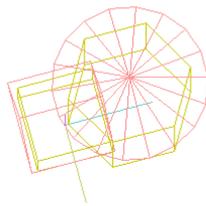
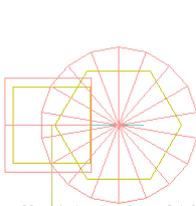
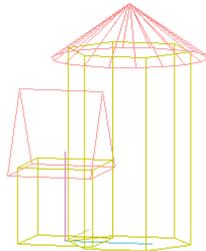
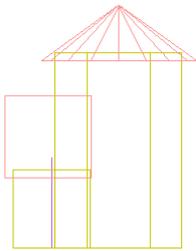
If the pyramid is the actual model (i.e. it is defined as the second model), then the line of intersection will be drawn on its surface:

Delete the pyramid from the composition (*new comp*), put the trapezoid into the composition (*merge*), then define the pyramid again by the data 5, 8, 0.1, 12 and 2.



In the drawing modes *paint* and *centr* only the composition is shown, i.e. the 2. model should be joined by the command *merge*.

4. problem



Prism to the left: 4, 7, 7, 10, 1, *def, z r- 3-times, merge*

Triangle roof: 3, 7, 7, 11, 2, *def, z r+ 2-times, x r- 6-times (into horizontal position), moving up on the top of the prism: z m+, y m-, merge*.

Tower: 6, 8, 8, 25, 1, *def, z r+ 2-times, y m+, merge*.

Conic roof: 18, 10, 0.1, 7, 2, *def, move upon the tower: y m+, z m+, merge*.

Delete the actual (last) model (*clear*), and choose the mode *paint* or *centr*.

Remarks:

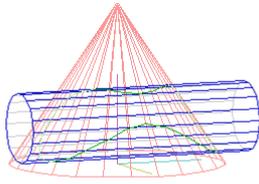
1. The picture can copied into the graphic editor paint or into word through the clip board (press Alt-PrintScreen then paste).

2. The stand alone program writes the data of the composition into a .wrl file, which can be transported e.g. into the program Euler3D.

5. problem

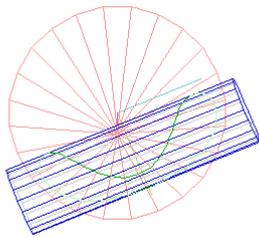
cone: 24, 8, 0.1, 12, 2, *def*, *merge*

cylinder: 18, 2.6, 2.6, 18, 3, *def*



rotate into horizontal position (x, r+ 6-times), move along y (m+ into symmetric position), move along z (m+ above the base of the cone)
change the direction of projection (left/right, up/down), move along x (m+), watch the line of intersection. If the configuration looks nicely, *merge*.

Change the mode into *paint* or *centr*.

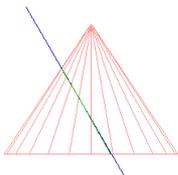


6. problem

delete the actual model (*clear*) and the composition (*new comp*), press *top/front* and *reset*.

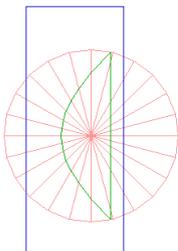
define the cone above again: 24, 8, 0.1, 12, 2, *def*, *merge*

define a rectangle: 2, 12, 12, 18, 3, *def*



rotate x, r+ 2-times, move z, m- 3-times, move y m+
watch the conic section
change the mode into *centr*

in order to get different conic sections
rotate again around x and move along y
change the direction of projection



merge the rectangle, move it upwards (z m+) and *merge* it again

colored picture will be shown in the *paint* mode

more constructions:

