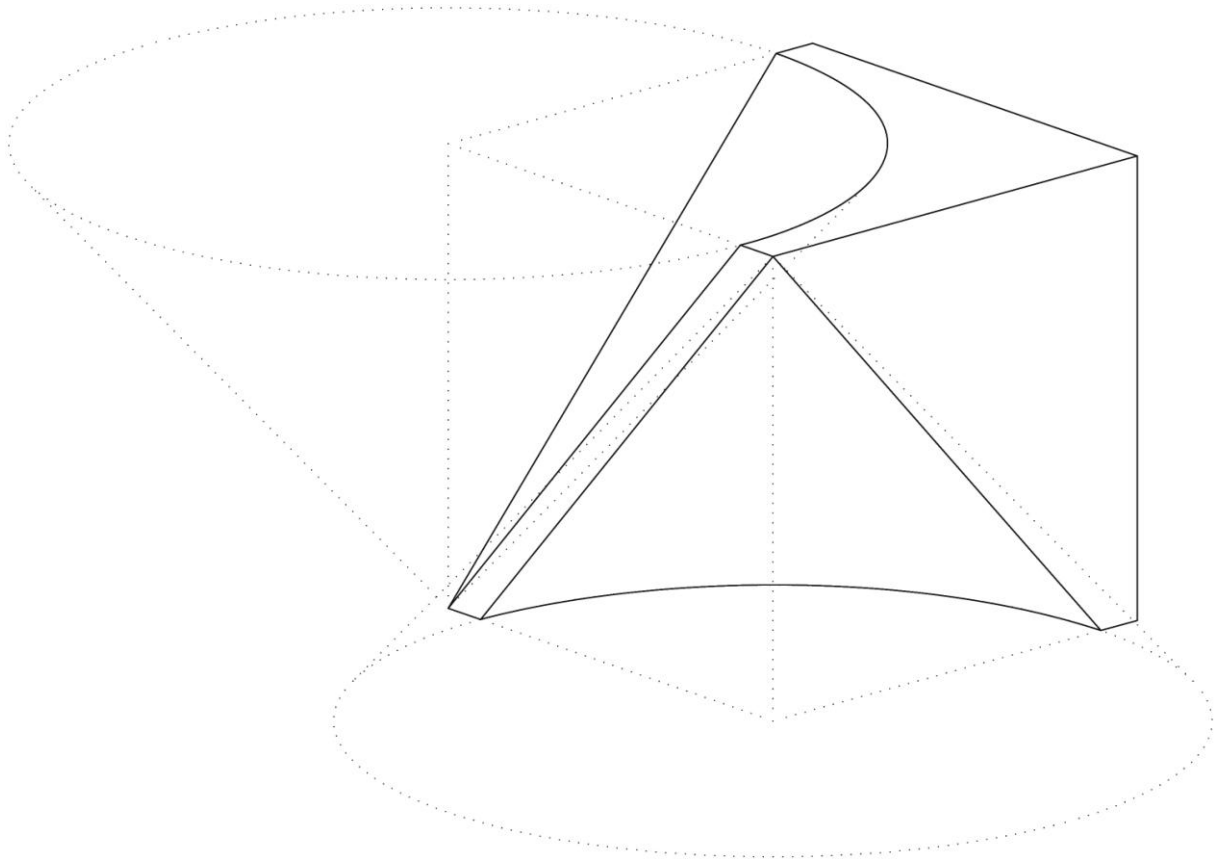


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Analytical drawing

This tutorial shows how to make an analytical drawing using Rhinoceros. Words in *italic* shall be typed in the command line.

1. Create a *box* measuring 10x10x10 units and two *cones* with radius 9, height 10 placed according to the drawing above.
2. Type *BooleanDifference*. Follow the instructions in the command line: Select the cube, press enter (or space). Since we want to keep the cones for later use, make sure you set Delete Input=No (switch status by pressing D or mouse click in the command line). Now select the cones and press enter.
3. Select the perspective view and type *ViewportProperties*. Set the projection to parallel in since we want to make an axonometric drawing.
4. Type *NamedView* and save the chosen view for your axonometric.

5. Select the main object and type *Make2D*. Unselect the hidden lines option. Make the visible lines go to Layer01. Press OK. If your 2d-lines are intersecting with your 3d-objects move them in top view.
6. Repeat the operation to make a drawing of the cones, but including hidden lines. Make all lines go to Layer02.
7. In top view, coordinate the two drawings. You might want to overlay the drawing with the uncut box as well (see drawing above).
8. Use the *LayerManager* and set the line properties so that Layer01 has continuous black lines with a print width of 0,15mm and Layer02 has dotted black lines with a default print width. If the dotted lines aren't dotted we need to change the multiplier of the linetype scale: File > Properties > Linetypes > Scale > 100. Note that you can add your own linetype definitions here.
9. *Print*. Under the Destination tab, choose Adobe PDF. Under View and Output Scale, use the move command if you need to move the view. Set the scale to a fixed value, i.e. 1:100. Under Linetypes and Line Widths, set the default line with to 0,1 mm (for the dotted lines). If you want several linetypes that are thinner than the presets, just change the line type scale.
10. Press print and your drawing is done.

Some tips for a better workflow in perspective view:

- Keep Ctrl-button down to drag objects along the z-axis.
- Right click on the rotate symbol to use the command Rotate3d which allows for an individual rotation axis.
- Press the TAB key to lock the cursor's direction of travel when you e.g. want to move an object in the direction towards another object but not all the way.
- Set the middle mouse button to run the command *ZoomSelected* to speed up your scene navigation. File > Properties > Mouse > Run this macro: *ZoomSelected*.