



Task 12 Largest Cylinder Inscribed in a Cone

1. Open a new window (**Ctrl+N**). In the Graphics view, use the “Circle” tool  to draw a circle centred at the origin and passes through (1,0).
2. Activate the 3D Graphics view. Use the Extrude to Pyramid or Cone tool  in the  toolbox. Drag up the circle to create a cone of height 2. Use the Point tool  to create the apex C of the cone.
3. Close the Graphics view and activate the Graphics 2 view. In Graphics 2 view create a slider e of value from 0 to 1 with increment 0.01.
4. Create a point D which moves on the altitude of the cone by entering:
(0, 0, e z(C))

5. Use the Perpendicular Plane tool  in the  toolbox, click on D and the z-Axis to create a plane f through D perpendicular to the z-Axis.

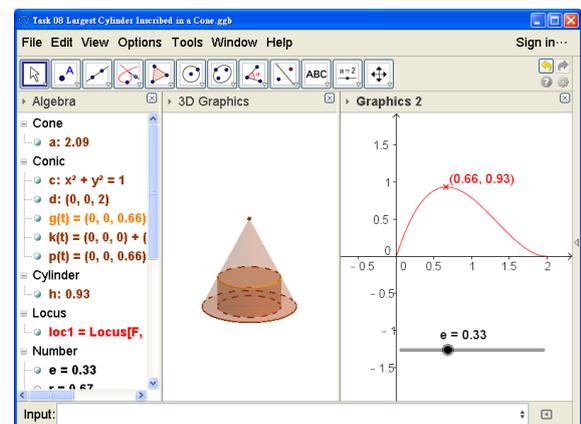
6. Use the Intersect Two Surfaces tool  , click on the plane f and the cone a to create the intersection curve of the cone and the plane. Hide the plane f.

7. Use the Point tool  to create a point E on the intersection curve. Enter:
r = Distance[D, E]

8. Use the Cylinder tool  in the  toolbox. Click on A, D and enter r to create the cylinder h inscribed in the cone. Make the cone more transparent. Hide the axe and the points.

9. Click on Graphics 2 view. In the input bar enter:
(z(D), h)
to create a movable point F to trace how the volume (h) varies against the height of the cylinder (z(D)).

10. Use the Locus tool  in the toolbox  . Click on the movable point F and the slider e to construct the locus of F when e varies. Change the style of F as “x” and label it by its value.
Colour F and the curve in red.



11. Drag the slider to investigate when the cylinder inscribed in the cone would be largest.