



# „CONTEMPORARY APPROACH TO THE DEVELOPMENT OF SPATIAL COMPREHENSION THROUGH AUGMENTED REALITY CONTENT“

**Warsaw University  
of Technology**

## ***7. Cutting the cone with 4 planes***

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<https://liggd.it/spacar/en/graphic-materials>

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**SPACAR**

**No. 2019-1-LT01-KA202-060471**

**Intellectual Output:** O1: Cutting Geometrical Solids with Planes.

**Exercise number:** 7

**Title:** Cutting the cone with 4 planes

**Description:**

The cone presented below has been cut with 4 planes –  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ . Construct horizontal and profile projections (A3 size, scale 1:1), locate the position of planes yourself, give specific angles designed, use paper and pencil or /and computer software.

After drawings answer the questions below:

1. Are the planes  $\alpha$  and  $\beta$  mutually perpendicular?  
If not, is the angle between them acute or obtuse?
2. Are the planes  $\gamma$  and  $\delta$  mutually perpendicular?  
If not, is the angle between them acute or obtuse?
3. What types of sections correspond to each plane: circle, ellipse, hyperbola, parabola?
4. What type of section would appear, if a vertical plane cuts through the apex of the cone?

**Given digital files:**

IO1-7-a.pdf: frontal projection of the cone and cutting planes

IO1-7-b.obj: 3D model of the given problem solved.

**Result:**

Frontal, horizontal and profile projections of the cone cut with 4 planes (A3 size, scale 1:1)  
Answer to questions 1-4.

**Prior knowledge:**

Basic knowledge related to descriptive geometry, knowledge of geometrical surfaces.

**Augmented reality content:**

3D model of geometric solid cut with relevant cutting planes.



## PROJECT CONSORTIUM PARTNERS:



P1. Vilnius Builders Training Centre [VSRC]



P2. Riga Technical University [RTU]



P3. Warsaw university of technology [WUT]



P4. Polytechnic university of Valencia [UPV]



P5. Siauliai vocational education and training centre [Siauliai PRC]



P6. SneakyBox [SBox]



P7. Jugendförderverein Parchim/Lübz e.V. [JFV PCH/LBZ e.V.]



P8. DECROLY, SL [DECROLY]