



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

**Warsaw University  
of Technology**

## ***17. Cutting the sphere 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:** 17

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

**Description:**

The sphere 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  $\delta$  mutually parallel?  
If not, do they intersect on the right or on the left side of the sphere?
2. If the planes  $\beta$  and  $\delta$  mutually intersect, would it break the sphere's outline? Why?
3. Which plane forms the section of the largest surface area?
4. Which plane forms the section of the smallest radius?

**Given digital files:**

IO1-17-a.pdf: frontal projection of the sphere and cutting planes

IO1-17-b.obj: 3D model of the given problem solved.

**Result:**

Frontal, horizontal and profile projections of the sphere 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.



Erasmus+

## PROJECT CONSORTIUM PARTNERS:



P1. Vilnius Builders Training Centre [VSRC]



P2. Riga Technical University [RTU]

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P3. Warsaw university of technology [WUT]



P4. Polytechnic university of Valencia [UPV]



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

SNEAKYBOX

P6. SneakyBox [SBox]



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



P8. DECROLY, SL [DECROLY]