



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

**Warsaw University  
of Technology**

## ***16. 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:** 16

**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 below or above the sphere?
2. Is it possible that the radius of the sphere's section would be greater than the radius of the sphere?
3. Which plane forms the section of the largest surface area?
4. Which plane forms the section of the smallest radius?

**Given digital files:**

IO1-16-a.pdf: frontal projection of the sphere and cutting planes

IO1-16-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.



## 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]



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P6. SneakyBox [SBox]



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



P8. DECROLY, SL [DECROLY]