



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

**Warsaw University  
of Technology**

## ***11. Cutting the sphere with 3 planes***

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

This project is funded with the support of the European Commission.

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**SPACAR**

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

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

**Exercise number:** 11

**Title:** Cutting the sphere with 3 planes

**Description:**

The sphere presented below has been cut with 3 planes –  $\alpha$ ,  $\beta$ ,  $\gamma$ . 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. What type of section do the planes form?
2. Sort the planes according to the radius of the section they form (from smallest to largest radius).
3. If the planes  $\alpha$  and  $\gamma$  mutually intersect, would it break the sphere's outline? Why?
4. Is it possible that the radius of the sphere's section would be greater than the radius of the sphere?

**Given digital files:**

IO1-11-a.pdf: frontal projection of the sphere and cutting planes

IO1-11-b.obj: 3D model of the given problem solved.

**Result:**

Frontal, horizontal and profile projections of the sphere cut with 3 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]



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P8. DECROLY, SL [DECROLY]