

1. Define incremental image synthesis and describe the related concepts we covered. Compare ray tracing with incremental image synthesis.
2. What is the graphics pipeline? What are its inputs and outputs? What are its main steps (e.g., the transformation stage)?
3. What are the input and output data at each step of the graphics pipeline? What does each step do?
4. What coordinate systems are used in the graphics pipeline? Briefly describe them.
5. What transformations are applied during the graphics pipeline? Describe them.
6. What is the projection matrix for a central projection with the origin as the center of projection onto a plane parallel to the  $XY$ -plane, located  $d$  units along the  $Z$ -axis? Derive it. (Include figures as well.)
7. Define the clipping stage of the graphics pipeline. Explain its purpose, the coordinate system in which it should be performed, and why.
8. Define rasterization and tessellation.
9. What algorithms may be used to determine which parts of a surface are visible in an image (occlusion)? Briefly describe them.
10. Describe back-face culling. Which problem does it solve?
11. Describe the painter's algorithm. Which problem does it solve?
12. Describe the Z-buffer algorithm.
13. Which local illumination shading models did we cover? Briefly describe them.
14. What is Gouraud shading? What is Phong shading? Compare the two.