

**Exam #3 — Take Home**  
**Due Friday, April 25**

This is a take-home exam. You may ask me questions, if needed, and you may refer to the course materials and various POV-Ray instructions and help, but you may not consult any other source human or nonhuman. The results are to be submitted directly into Blackboard.

- Use the methods described in the handout “Coordinates for the Platonic Solids” to determine the coordinates for the vertices of the icosahedron and the sets (triples) of vertices that correspond to the 20 triangles of the icosahedron.
- Use the methods described in the handout “Coordinates for the Platonic Solids” to determine the coordinates for the vertices of the dodecahedron and the sets of sequences of five vertices that correspond to the 12 pentagons of the dodecahedron.
- Use the results of these calculations to create images of these two polyhedra with POV-Ray. Use exact coordinates (e.g., making use of the sqrt function rather than decimal approximations). Please begin by copying and pasting the contents of the file “Pyramid constructed using its vertices and polygons” that can be found under “Some of Examples” on the course website, and then renaming and modifying this file. Note that if you display these two polyhedra together with the vertices calculated as above, you may want to translate one or both of the objects so that they do not overlap. However, you may wish to have them deliberately overlap, and perhaps use some transparent textures.
- Feel free to be creative in your images. You don’t have to have a “floor” if you don’t want to. Experiment with different textures. You may try placing multiple copies of the objects in interesting arrangements. You may wish to try using spheres for vertices and cylinders for edges to display an object.
- Submit the POV-Ray source file(s) (.pov) to the course Blackboard site.
- Submit the rendered image file(s) (e.g., .bmp or .png) to the course Blackboard site.
- I believe Blackboard will accept uploads of multiple files, but if not, the files can be emailed directly to me. Include a clear Subject in these emails.