



Test 1: answers

The test on 29 April 2010 consisted of four questions. The first two were just curious about your experience with computer graphics. In total, there were 13 answers.

Question 1 ...

... asked whether you have a CAD application installed on your machine. Six said they do not (close to 50%). The other seven gave one or more names of such software: Maya (3), Blender (2), and 3d Studio Max, zBrush, Auto CAD, Inkscope, Illustrator. So among us, there is considerable and varied experience. We should make good use of it.

Question 2 ...

... more directly asked whether you actually use that installed system or a different one. Seven said yes, four indicated some occasional or initial acquaintance, two said no. More intense usage is the exception.

Question 3 ...

... was: "What is a wireframe model?"

In threedimensional space, a "solid object" is a continuous, closed, and bounded set of points. "Continuous" means that each point of the set has neighbors in any of its neighborhoods, no matter how small that neighborhood may be. Being bounded means, the set is entirely contained in a finite cube. Solids do not change their form. Solids have surfaces.

A *polyhedron* is a special solid object. Its surface is made up of planar facets. Each of these facets is a polygon. Because of this, the surface of the solid can be defined in terms of vertices, connected by straight-line segments ("edges") where each line segment is shared by a neighboring facet.

A wireframe rendition of a solid renders only the edges of the surface of the solid. We may think of the wireframe model as the minimal rendering of the surface of the solid. From the wireframe, the entire solid can be reconstructed because of the planarity of the facets.

The term "skeleton", that some of you used in answers, is a bit misleading, but it is not totally wrong. It is a bit misleading insofar as a skeleton defines a body from "inside". The wireframe defines it from outside. The wireframe is a mesh that precisely defines the set of polygons making up the solid's surface. Wireframe models can be seen as linear approximations to curved surfaces.

Question 4 ...

... has a very simple answer: The surface of a sphere is the set of all those points in 3D space whose distance from a fixed point, M , is equal to a given number $r > 0$.

We can describe this set mathematically as

$$\{P \in \mathfrak{R}_3 \mid d(M, P) = r\}$$

where $M \in \mathfrak{R}_3$ and $r > 0$ are given, and d denotes the Euclidean distance.

This question produced a variety of answers, many of which were close to nonsense in this specific context. We will take up a few in class.