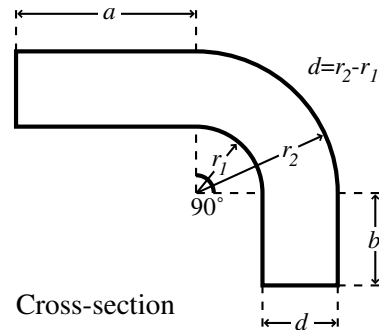# 1998 Paper 7 Question 12

**Advanced Graphics**

Perspective view

Cross-section

Show how the above object can be constructed using Constructive Solid Geometry (CSG). You may assume the following primitives: sphere, cylinder, cone, torus, box.   [4 marks]

Show how the same object can be constructed as a swept object.   [3 marks]

Explain how you would convert the swept object into polygons.   [4 marks]

What extra work would you need to do if you had to convert it into triangles?
[1 mark]
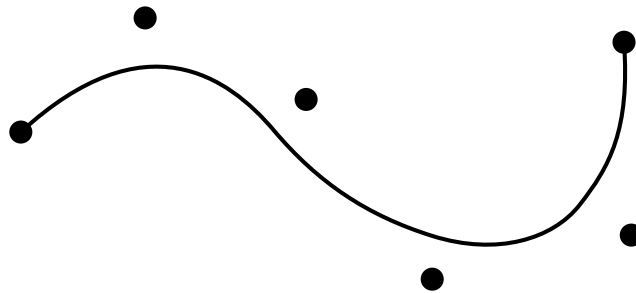
Consider the design of a user interface for a NURBS drawing system, which enables curves like that above to be drawn. Users should have access to the full expressive power of the NURBS representation. What things should users be able to modify to give them such access and what effect does each have on the resulting shape?
[6 marks]

Users will need to select the control points for curves like that drawn above. You need to decide the size to draw the control points. What does Fitts' Law tell you about how choice of size affects user interaction speed?   [2 marks]

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