

## PROBLEM CORNER

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**Complete solutions** to this set of problems can be found at this URL:

<http://140.114.32.248/d2/3problems/2014-10/Problem%20Corner.html>.

You may need to install the Cabri3D plugin to view the solutions. It can be found at

<http://www.cabri.com/download-cabri-3d.html#plugin>.

The solution to Problem 3 in Chinese can be found at:

<http://pisa.math.ntnu.edu.tw/attachments/article/1075/26%20saymathsgame.pdf>

and its English translation at:

[https://php.radford.edu/~ejmt/ProblemCornerDocs/Solution\\_to\\_Problem3\\_for\\_Oct2014\\_en.pdf](https://php.radford.edu/~ejmt/ProblemCornerDocs/Solution_to_Problem3_for_Oct2014_en.pdf).

### **Problem 1**

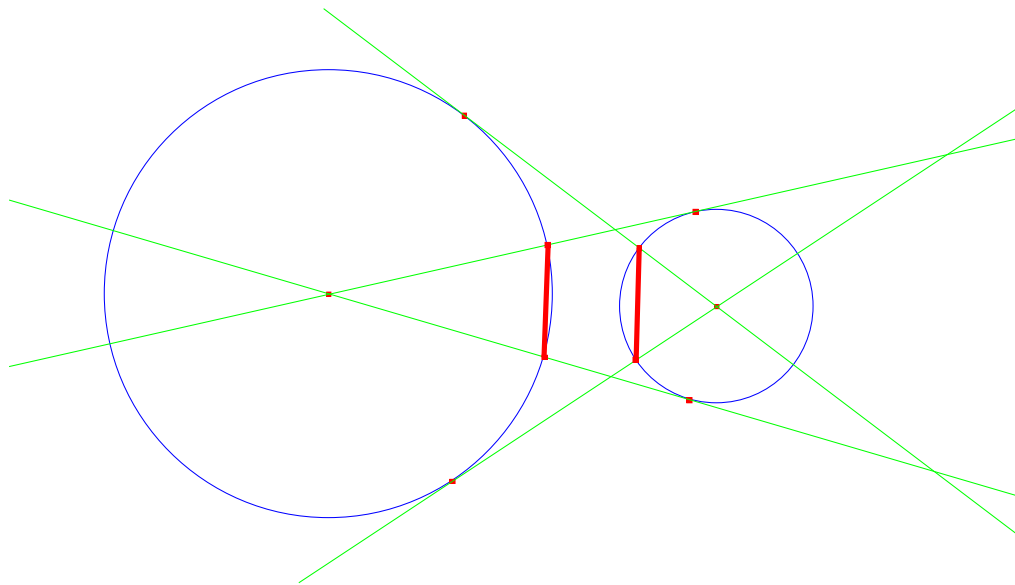
Show that the Bucky ball (truncated icosahedron) can be expressed as the intersection of an octahedron with an icosahedron.

### **Problem 2**

In this problem, the wireframe of a cube is defined as the set formed by the union of the 12 edges. Construct three cubes so that every pair of the three wireframes meet at exact 10 points.

### **Problem 3**

Prove the Eyeball Theorem based on expressing area of the shaded triangle (see <http://sylvester.math.nthu.edu.tw/d2/3problems/2014-10/Hint.html>) in two different ways.



Reference: David Wells, A Dictionary of Curious and Interesting Geometry