THREE PUZZLES
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1) Design a set $S_1$ of 24 dissimilar [non-convex] polyhedra with plane faces, such that
   (a) three concurrent edges of each polyhedron have integer lengths;
   (b) the volume of each polyhedron is proportional to the sum of the lengths of
       the three concurrent edges described in 1(a);
   (c) the set $S_1$ can be partitioned into six subsets, each of which packs a regular tetrahedron.

2) Design a set $S_2$ of 24 dissimilar [non-convex] polyhedra with plane faces, such that
   a) four concurrent edges of each polyhedron have integer lengths;
   b) the volume of each polyhedron is proportional to the sum of the lengths of
       the four concurrent edges described in 2(a);
   c) the set $S_2$ can be partitioned into four subsets, each of which packs a regular octahedron.

3) Design a set $S_3$ of 24 dissimilar [non-convex] polyhedra with plane faces, such that
   a) three concurrent edges of each polyhedron have integer lengths;
   b) the volume of each polyhedron is proportional to the sum of the lengths of
       the three concurrent edges described in 3(a);
   c) the set $S_3$ can be partitioned into three subsets, each of which packs a cube.

The solutions will be posted on May 1, 2014 at schoengeometry.com.