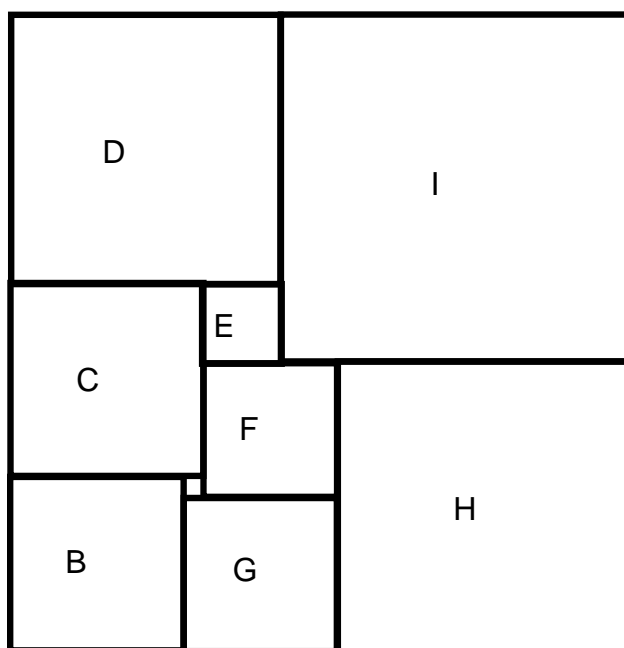


MATHEMATICS ENRICHMENT CLUB.
Problem Sheet 11, August 5, 2014 ¹

1. In a plane lie 127 cogs. The teeth of cog 1 engage those of cog 2. The teeth of cog 2 engage those of cog 3 and so on. Finally the teeth of cog 127 engage those of cog 1. Can the cog wheels so arranged be turned?



2. Nine squares are arranged to form a rectangle as shown. The smallest square has area 1, and the total area of the rectangle.

4. A right pyramid has square base $ABCD$ with sides of length b and apex X