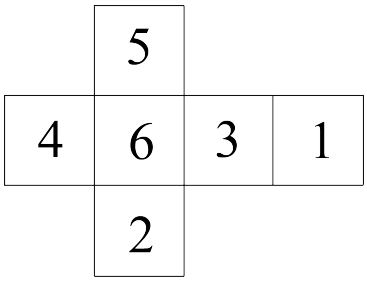
Problem of the Week

Problem C

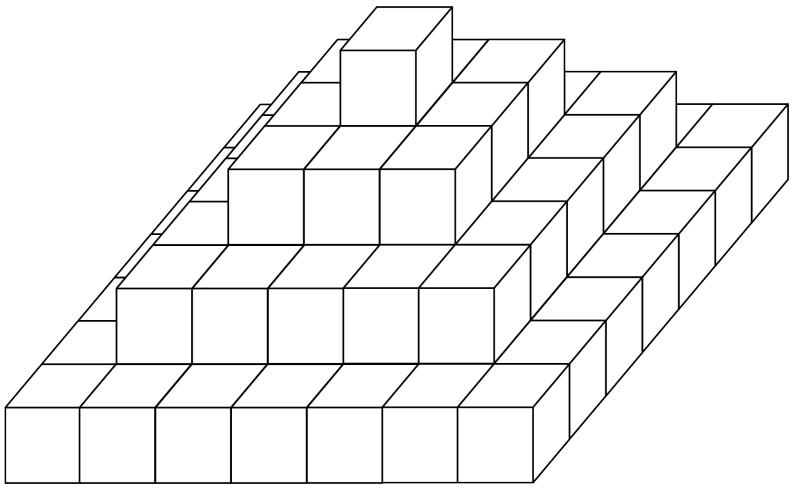
Counting Numbered Cubes

Dmitri has a collection of identical cubes. Each cube is labelled with the integers 1 to 6, as shown in the following net:



(This net can be folded to make a cube.)

He forms a pyramid by stacking layers of the cubes on a table, as shown, with the bottom layer being a 7 by 7 square of cubes.



(a) Determine the total number of cubes used to build the pyramid.

(b) How many faces are visible after the pyramid is built and sitting on the table?

(c) He wants to position the cubes so that when all of the visible numbers are added up, the total is as large as possible. What is this total?

Themes: Geometry & Measurement, Number Sense