MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 1 – OCTOBER 2011
ROUND 1 VOLUME & SURFACES

ANSWERS

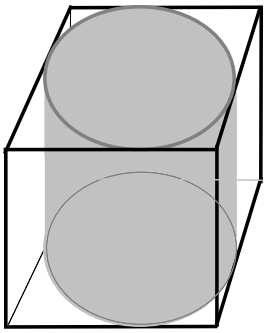
A) _____ : _____

B) _____

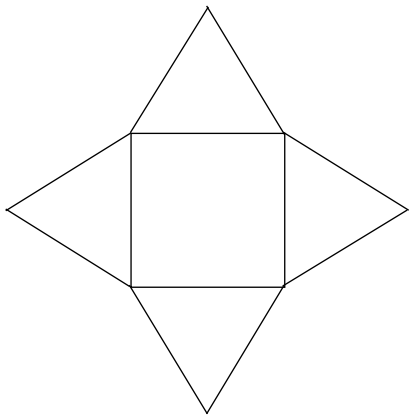
C) _____

******* NO CALCULATORS ON THIS ROUND ******

A) A cylinder is <u>inscribed</u> in a cube such that the bases lie in opposite faces of the cube. Compute the ratio of the volume of the cylinder to the volume of the cube.



B) Each segment in the template to the right has length 6. The template is comprised of a square and 4 equilateral triangles. If folded along the sides of the square, a pyramid with a square base is formed. Compute its volume.



C) The diagonal of a rectangular solid is $4\sqrt{10}$ units. The length of the solid is $\sqrt{3}$ times as long as its width. The height of the solid is 2 less than its width. Compute the volume of the solid.