MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 1 – OCTOBER 2008
ROUND 1 VOLUME & SURFACES

ANSWERS

A) _____

B) _____ cm

C) _____

A) Determine the exact length of the interior diagonal of a cube if its total surface area is 1.

B) A hollow spherical metal ball has a 3 cm thick wall. If the total volume of metal is 684π cm^3, compute the outer diameter of the spherical ball.

Note: The outer diameter refers to the longest segment between two points on the outer surface of the ball.

C) A cube has edges of length 2. A plane determined by the midpoints of three edges of the cube that intersect at a common vertex divides the cube into two regions whose volumes are in the simplified ratio of $a : b$, where $a > b$. Determine $a - b$.