MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 1 – OCTOBER 2012
ROUND 1 VOLUME & SURFACES

ANSWERS

A) _____ units

B) _____ units^3

C) (_____ , _____)

A) The total surface area of a cube is numerically equal to one-third of its volume.
Compute all possible positive lengths of an edge of this cube.

B) Compute the volume of a rectangular prism that has three faces with areas 54, 36 and 24 square units.

C) A sphere is inscribed in a cube.
Let P denote the volume of the sphere.
Let Q denote the volume of the region inside the cube and outside the sphere.
Let R denote the exact value of $\frac{P}{Q}$.
The denominator of this fraction cannot be rationalized.
Let L denote the larger volume (either P or Q).
Specify the ordered pair (R, L).