

MASSACHUSETTS MATHEMATICS LEAGUE
CONTEST 1 – OCTOBER 2014
ROUND 1 VOLUME & SURFACES

ANSWERS

A) _____

B) _____

C) (_____ , _____)

A) The volume of a cone is 18π cubic units. The circumference of its circular base is 8π units. Compute the cube root of the height of the cone.

B) A cross section of a sphere 9 units from the center of the sphere is a circle that has an area of 144π units². Compute the volume of a hemisphere of this sphere.

C) The sides of a cube have length 12 units. Plane $PQRS$ divides the cube into two regions whose volumes are in a ratio of 3 : 29. P and Q are each midpoints of a pair of opposite edges. R and S are located on another pair of opposite edges such that $\overline{SR} \parallel \overline{PQ}$ as shown. R divides \overline{TV} into a ratio of $a : b$, where a and b are integers and $a > b$. Compute the ordered pair (a, b) .

