

# MBMT Geometry Round – Ramanujan

April 1, 2017

Full Name \_\_\_\_\_

Team Number \_\_\_\_\_

**DO NOT BEGIN UNTIL YOU ARE  
INSTRUCTED TO DO SO.**

This round consists of **8** questions. You will have **30** minutes to complete the round. Each question is *not* worth the same number of points. Questions answered by fewer competitors will be weighted more heavily. Please write your answers in the simplest possible form.

\_\_\_\_\_ 1 What is the distance between the points  $(6, 0)$  and  $(-2, 0)$ ?

\_\_\_\_\_ 2 Angle  $X$  has a degree measure of 35 degrees. What is the supplement of the complement of angle  $X$ ?

The complement of an angle is 90 degrees minus the angle measure. The supplement of an angle is 180 degrees minus the angle measure.

\_\_\_\_\_ 3 A cube has a volume of 729. What is the side length of the cube?

\_\_\_\_\_ 4 A car that always travels in a straight line starts at the origin and goes towards the point  $(8, 12)$ . The car stops halfway on its path, turns around, and returns back towards the origin. The car again stops halfway on its return. What are the car's final coordinates?

\_\_\_\_\_ 5 A full, cylindrical soup can has a height of 16 and a circular base of radius 3. All the soup in the can is used to fill a hemispherical bowl to its brim. What is the radius of the bowl?

\_\_\_\_\_ 6 In square  $ABCD$ , the numerical value of the length of the diagonal is three times the numerical value of the area of the square. What is the side length of the square?

\_\_\_\_\_ 7 Consider triangle  $ABC$  with  $AB = 3$ ,  $BC = 4$ , and  $AC = 5$ . The altitude from  $B$  to  $AC$  intersects  $AC$  at  $H$ . Compute  $BH$ .

\_\_\_\_\_ 8 Mary shoots 5 darts at a square with side length 2. Let  $x$  be equal to the shortest distance between any pair of her darts. What is the maximum possible value of  $x$ ?