

MBMT Algebra 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 David and Guang have 8 pencils to divide among themselves. David takes 7 of the pencils, while Guang takes the rest. What fraction of the pencils did Guang receive?
- _____ 2 DJ Khaled wants to buy more keys. The key maker tells DJ Khaled that each key is worth the same amount, and 4 keys are worth \$20. How much are 6 keys worth?
- _____ 3 Mr. Street is using his newly patented stapling technique to staple packets for his class. If there are 1000 sheets of paper when Mr. Street starts stapling, each packet contains 5 sheets of paper, and each packet takes 2 seconds to staple, how long in seconds does it take Mr. Street to staple all the packets for his class?
- _____ 4 20 people rate a Naturday Sight Live skit an integer from 1 to 10, inclusive. If the arithmetic mean of the ratings is 9.7, what is the minimum number of people who rated the skit a 10?
- _____ 5 Kermit takes a positive integer n , multiplies it by itself, subtracts 3, and then multiplies the entire expression by 2, resulting in n . What is n ?
- _____ 6 Find the sum of all positive integers x such that $3 < \sqrt{x} < 3.6$.
- _____ 7 Kanye West really likes driving from his house to the studio in his Mercedes. On a day where traffic is moving smoothly, Kanye can get to the studio from his house in 30 minutes. On a day with a lot of traffic, it takes Kanye 50 minutes to reach the studio from his house, and his average speed is 20 miles per hour slower than usual. How far, in miles, is the studio from Kanye's house?
- _____ 8 Alex is playing with some goo. The goo is very magical: each morning at 7:00 AM it will make itself 60% longer. Every day, Alex wakes up at 8:00 AM, plays with it and stretches it by another 25%. If the goo is 1 meter long at 6:59 AM on Monday, on what day of the week will it surpass 2017 meters in length?