

## Srinivasa Ramanujan Reading Comprehension

Name \_\_\_\_\_

Srinivasa Ramanujan was an acclaimed Indian mathematician who was born in southern India in 1887. Growing up, he attended a local grammar school and high school, fostering an interest in mathematics from a very early age. At age 15, Ramanujan read an old math book titled *A Synopsis of Elementary Results in Pure and Applied Mathematics* cover to cover, and was transfixed. He perused all of the theorems outlined in the book and began writing some of his own.

Ramanujan received scholarships to both the Government College in India and the University of Madras, but upon attending, lost both due to his tendency to focus on his math classes and neglect all others. Regardless, he continued his pursuit of math and published a 17-page paper on Bernoulli numbers in the *Journal of the Indian Mathematical Society* in 1911.

In 1913, Ramanujan began writing to G. H. Hardy, a British mathematician. Hardy was impressed with Ramanujan's ideas and got him both a research scholarship at the University of Madras and a grant from Cambridge University. In 1914, Hardy asked Ramanujan to come study under him at Cambridge. This request spurred a five-year mentorship between Hardy and Ramanujan; during that time, Ramanujan published over 20 papers individually and countless more in collaboration with Hardy. He received a bachelor of sciences for research in 1916 and became part of the Royal Society of London in 1918.

One of Ramanujan's goals was to find an exact formula for integer partitions of  $n$ — in other words, a formula to determine the exact number of ways we can add up to a number using positive integers. For example, we can add up to 3 using  $1+1+1$  and  $1+2$ , so the number 3 has two partitions. Ramanujan and Hardy found and published this exact formula in 1918; Ramanujan also helped to develop the theory of modular forms, and studied mock theta functions in the later years of his life.

Ramanujan died in 1920 at the age of 32 from tuberculosis. He published 37 papers and chronicled his theorems in multiple notebooks. What makes his discoveries so significant is that there are no proofs for any of his discoveries: he was able to make conjectures about numbers and number theory through his own brain power without using math and logic to prove them. Today, many of the claims from his notebooks have been proven. But of all the mathematical mysteries associated with Ramanujan, perhaps the most elusive is the workings of his mind that allowed him to devise such complex theorems.

1. **What phrase could replace “transfixed” as used in the first paragraph?**
  - A. completely bored
  - B. totally interested
  - C. concentrating hard
  - D. easily distracted
  
2. **What was the effect of Ramanujan’s reading of *A Synopsis of Elementary Results in Pure and Applied Mathematics*?**
  - A. Ramanujan began writing his own theorems
  - B. Ramanujan found he loved math
  - C. Ramanujan began writing to Professor Hardy
  - D. Ramanujan attended a local grammar school
  
3. **Which of the following best describes Ramanujan as a student?**
  - A. Unsuccessful because he was only interested in his math classes
  - B. Successful because he was so interested in his math classes
  - C. Successful because he neglected classes that were not math classes
  - D. Unsuccessful because he only received scholarships to two universities
  
4. **Which question is NOT answered?**
  - A. When did Ramanujan and Hardy find the formula for integer partitions of  $n$ ?
  - B. What is an example of a mock function?
  - C. What is an example of a partition in math?
  - D. For how long did Professor Hardy mentor Ramanujan?
  
5. **According to the passage, what did the author find most IMPRESSIVE about Ramanujan?**
  - A. He was able to become part of the Royal Society of London
  - B. Along with Professor Hardy, he was able to find a formula for integer partitions of  $n$
  - C. He was able to make incredible conjectures about math theory with actual proof – only mind power
  - D. He developed theorems of modular forms
  
6. **To which of the following questions would “many of the claims from his notebook have been proven” be the answer?**
  - A. How are Ramanujan’s works used today in the field of mathematics?
  - B. What makes Ramanujan’s contributions in math so important?
  - C. How can we tell whether or not the conjectures made by Ramanujan actually had value?
  - D. How can we tell which of these theorems were conjectures and which were mathematic formulas?

**7. Which of the following is a reasonable assumption?**

- A. Ramanujan would have likely made additional contributions in the field of mathematics had he submitted more articles to the *Journal of the Indian Mathematical Society*
- B. Ramanujan likely would have made additional contributions in the field of mathematics had he studied harder in college
- C. Ramanujan likely would have made additional contributions in the field of mathematics had he kept Professor Hardy as a mentor for more than five years
- D. Ramanujan likely would have made additional contributions in the field of mathematics had he not died so young