

## Chapter 4: Ramanujan

### WARMING UP [PAGE 91]

#### Warming up | Q 1 | Page 91

**Discuss orally in your class.**

In what subjects is knowledge of mathematics used, at the school level, and college/university level. Name them.

Did you know maths is used in music and poetry also? Can you tell how?

### SOLUTION

knowledge of maths is used in science, physics, chemistry, economics, accountancy, etc. Poetry- rhymes, rhythm; music- beat, rhythm, etc.

#### Warming up | Q 2 | Page 91

Use the letters in the word MATHEMATICIAN to make 4 letters/5 letter and 6 or more letter words, within a time limit fixed by your teacher.

### SOLUTION

Mathematician: cinema, anthem, thematic, machine, attach, match, meant, mice, item, mime, hate, heat, them, team, etc.

### ENGLISH WORKSHOP, SIMPLE [PAGES 95 - 97]

#### English workshop | Q 1. (A) | Page 95

**Use the following words/phrases to make sentences of your own.**

enthusiasm

to lope off

fraud

clarity

amiable

to come to terms with

conveyance

### SOLUTION

enthusiasm	The hikers set off on the hike with great enthusiasm.
to lope of	The deer loped off easily after being freed from the trap
fraud	The doctor was arrested by the 1 police for being a fraud.
clarity	The teacher told the student that there was no clarity in her answers
amiable	The Principal was happy that the new teacher was an amiable person.



to come to terms with	The doctor advised the woman to come to terms with her illness.
conveyance	The minister refused to come to the party unless he was provided conveyance

### English workshop | Q 2. (a) | Page 95

**Say WHY.....**

Ramanujan's letter bored and irritated Hardy, at first

#### **SOLUTION**

Ramanujan's letter was written in halting English and signed by a person unknown to Hardy. The script appeared to consist of theorems, most of them wild or fantastic-looking. Some of them though well-known were laid out as though they were original. There were no proofs of any kind. It seemed to be a kind of fraud, and hence bored and irritated Hardy.

### English workshop | Q 2. (b) | Page 95

**Say WHY.....**

Hardy invited Littlewood for a discussion.

#### **SOLUTION**

Hardy could not get the Indian manuscript out of his mind. It had wild theorems he had never seen before or imagined. He wondered if it was an unknown mathematician of genius. He had another look at the script and then invited Littlewood for a discussion to clarify his doubts.

### English workshop | Q 2. (c) | Page 95

**Say WHY.....**

Mother agreed to send Ramanujan to England.

#### **SOLUTION**

Ramanujan's mother had a dream in which she saw her son seated in a big hall among a group of Europeans and the goddess of Namakkal had commanded her not to stand in the way of her son fulfilling his life's purpose. Hence, obeying the command of the goddess of Namakkal, the mother agreed to send Ramanujan to England.

### English workshop | Q 2. (d) | Page 95

**Say WHY.....**

Hardy and Ramanujan could not talk freely with each other.

#### **SOLUTION**

Ramanujan was an untrained > genius. There was a big difference in Ramanujan's and Hardy's education. Ramanujan knew nothing of modern rigor; he did not know what



proof was and Hardy was obliged to teach him some formal mathematics. He was sometimes confused with Hardy's conversation when it was outside mathematics. Due to all these reasons, Hardy and Ramanujan could not talk freely with each other.

### English workshop | Q 2. (e) | Page 95

**Say WHY.....**

Ramanujan had to be hospitalized.

#### **SOLUTION**

Ramanujan had to be hospitalized because he was ill. He later died of tuberculosis.

### English workshop | Q 2. (f) | Page 95

**Say WHY.....**

Ramanujan found the number 1729 very interesting.

#### **SOLUTION**

Ramanujan found the number 1729 very interesting because it is the smallest number expressible as the sum of two cubes in two different ways.

### English workshop | Q 3 | Page 95

Read the text and enlist the achievements and honours of Ramanujan, received in England.

#### **SOLUTION**

Ramanujan's achievements and honours received in England:

1. The Royal Society elected him a Fellow at the age of thirty (which, even for a mathematician, is very young)
2. Trinity College elected him a Fellow in the same year.
3. Ramanujan was the first Indian to be given either of these distinctions.

### English workshop | Q 4. (A). (a) | Page 96

**Underline the verb in the following sentence and state whether the sentence is Active or Passive voice.**

England gave Ramanujan great honours.

#### **SOLUTION**

England **gave** Ramanujan great honours. - **Active**

### English workshop | Q 4. (A). (b) | Page 96

**Underline the verb in the following sentence and state whether the sentence is in Active or Passive voice.**

A large untidy envelope was decorated with Indian stamps.

#### **SOLUTION**

A large untidy envelope **was decorated** with Indian stamps. - **Passive**

**English workshop | Q 4. (A) . (c) | Page 96**

**Underline the verb in the following sentence and state whether the sentence is in Active or Passive voice.**

The timetable was not altered.

**SOLUTION**

The timetable was not altered - **Passive**

**English workshop | Q 4. (A) . (d) | Page 96**

**Underline the verb in the following sentence and state whether the sentence is in Active or Passive voice.**

She saw her son in a big hall.

**SOLUTION**

She saw her son in a big hall. **Active**

**English workshop | Q 4. (A) . (e) | Page 96**

**Underline the verb in the following sentence and state whether the sentence is in Active or Passive voice.**

Hardy corrected his statement.

**SOLUTION**

Hardy corrected his statement. **Active**

**English workshop | Q 4. (A) . (f) | Page 96**

**Underline the verb in the following sentence and state whether the sentence is in Active or Passive voice.**

Ramanujan was brought to England.

**SOLUTION**

Ramanujan was brought to England. **Passive**

**English workshop | Q 4. (B) . (a) | Page 96**

**Change the voice in the following sentence.**

Hardy taught Ramanujan.

**SOLUTION**

Ramanujan was taught by Hardy.

**English workshop | Q 4. (B) . (b) | Page 96**

**Change the voice in the following sentence.**

He knew nothing of the modern rigour.

**SOLUTION**

Nothing of the modern rigour was known by him.

**English workshop | Q 4. (B). (c) | Page 96**

**Change the voice in the following sentence.**

Sheets of paper were found in it, by Hardy.

**SOLUTION**

Hardy found sheets of paper in it.

**English workshop | Q 4. (B). (d) | Page 96**

**Change the voice in the following sentence.**

Hardy was bored by that manuscript.

**SOLUTION**

That manuscript bored Hardy.

**English workshop | Q 4. (B). (e) | Page 96**

**Change the voice in the following sentence.**

Trinity supported unorthodox talent.

**SOLUTION**

Unorthodox talent was supported by Trinity.

**English workshop | Q 4. (B). (f) | Page 96**

**Change the voice in the following sentence.**

He could not break the ban.

**SOLUTION**

The ban could not be broken by him.

**English workshop | Q 5. (a) | Page 96**

**Identify whether the following is a Simple, Complex, and Compound sentence.**

When he opened it, he found sheets of paper.

**SOLUTION**

When he opened it, he found sheets of paper. - **Complex**

**English workshop | Q 5. (b) | Page 96**

**Identify whether the following simple, Complex, and Compound sentence.**

He glanced at a letter.

**SOLUTION**

He glanced at a letter. - **Simple**

**English workshop | Q 5. (c) | Page 96**

**Identify whether the following are Simple, Complex, and Compound sentence.**

Hardy was not only bored but he was also irritated.



### **SOLUTION**

Hardy was not only bored but he was also irritated. - **Compound**

### **English workshop | Q 5. (d) | Page 97**

**Identify whether the following is a Simple, Complex, and Compound sentence.**

Ramanujan turned out to be a poor clerk.

### **SOLUTION**

Ramanujan turned out to be a poor clerk. - **Simple**

### **English workshop | Q 5. (e) | Page 97**

**Identify whether the following is a Simple, Complex, and Compound sentence.**

If Ramanujan had been better educated, he would have been even more wonderful than he was.

### **SOLUTION**

If Ramanujan had been better educated, he would have been even more wonderful than he was - **Complex**

### **English workshop | Q 5. (f) | Page 97**

**Identify whether the following is a Simple, Complex, and Compound sentence.**

Ramanujan was self-taught: he knew nothing of the modern rigour.

### **SOLUTION**

Ramanujan was self- taught: he knew nothing of the modern rigour- **Compound**

### **English workshop | Q 6 | Page 97**

**Interview Question.**

A brilliant student from your school has won a Mathematics Quiz at the National Level.

Frame questions to interview him/her when the school felicitates him/her.

Follow the steps given below.

1. Greetings
2. Introduction of the interviewee and achievements.
3. 2 or 3 questions about growing years.
4. 4 to 6 questions about the achievements.
5. 2 or 3 questions about future plans and prospects.
6. Expression of thanks and good wishes.

### **SOLUTION**

1. Good morning, Rachana. First of all, let me offer you my congratulations on winning the Mathematics Quiz. and that too, at the National Level. May I ask you a few questions about your achievement?



2. Did you have a great interest in mathematics in the early years of your childhood?
3. How did you develop this interest?
4. How long did you prepare yourself before participating in this Quiz?
5. Who helped you and guided you?
6. Who encouraged you or motivated you at that stage?
7. How did you feel when you were actually answering the questions?
8. What is the next step from here?
9. Do you plan to make a career in mathematics?
10. Any message to others interested in mathematics?
11. Thank you, and all the best for your future. Goodbye.

### English workshop | Q 7 | Page 97

#### Summary

- Read the first three paragraphs on Page 92. (From..... 'One morning ..... up to ..... a discussion after hall)
- Re-read the same noting down only important points.
- Rewrite the important points in your own simple language, in your notebook.
- Make certain that your summary is less than half the length of the original passage.

#### SOLUTION

#### THE MANUSCRIPT

One morning in 1913, Hardy received an envelope from India. It contained many lines of symbols, written in non English script. The letter with it, written in halting English and signed by an unknown Indian, wanted Hardy's opinion on the mathematical discoveries enclosed. These were only some known and unknown theorems, without any proofs. Hardy, bored and irritated, put the manuscript aside and went to play tennis. However, his pleasure in his game was interrupted by the thought of the Indian manuscript with the wild theorems he had left behind. He wondered if the man was a genius. When he returned to his room, he took another look at the script. Then he sent word to Littlewood that they must have a discussion after hall.

