

## 4.4 Ramanujan

**Warning up:-**

**1. Discuss orally in your class.**

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

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

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

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

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

**3. Sentences can be classified into three types - Simple, Complex and Compound.**

**A Simple Sentence is one that has only one Subject and one Predicate. It has only one Finite verb.**

**For example:-** (1) She went home.

(2) In the morning, near my school I saw a snake.

**A Complex Sentence consists of one Main Clause and one or more Dependent or Subordinate Clauses.**

**For example:-** (1) She went home, after school was over.

(2) The boys found the book that had been lost.

**A Compound Sentence consists of two or more Independent or Co-ordinate Clauses. They are joined by Co-ordinators.**

**For example:-** and, but, so, or, for etc.

(a) He finished his work and he left his office.

(b) He is poor but he is honest.

**From the lesson 4.2 pick out one example of each of the following.**

**(1) Simple Sentence**

**Ans:-** Modern techniques are used nowadays for anaesthesia.

**(2) Complex Sentence**

**Ans:-** Today, if you need to have a heart surgery, you can choose from many fine doctors.

**(3) Compound Sentence**

**Ans:-** Over the years now, revolutionary steps have been taken in different types of complicated surgery and these have made such operations successful.

**English Workshop:-**

**1. (A) Use the following words / phrases to make sentences of your own.**

**(1) enthusiasm**

**Ans:-** The hikers set off on the hike with great enthusiasm.

**(2) lope off**

**Ans:-** The deer loped off easily after being freed from the trap.

**(3) fraud**

**Ans:-** The doctor was arrested by the police for being a fraud.

**(4) clarity**

**Ans:-** The teacher told the student that there was no clarity in her answers.

**(5) amiable**

**Ans:-** The Principal was happy the the new teacher was an amiable person.

**(6) come to terms with**

**Ans:-** The doctor advised the woman to come to terms with her liness.

**(7) conveyance**

**Ans:-** The minister refused to come to the party unless he was provided conveyance.

**(B) The following words can be used as Nouns as well as Verbs.**

**(Visit /honour/report/watch/form/ surprise.)**

**(1) Visit**

**Ans:-** (i) My grandmother came over for a visit yesterday. (noun)

(ii) "We must visit the zoo when we go to Hyderabad," said Meera. (verb)

**(2) honour**

**Ans:-** (i) It was an honour to have such a great scientist visit our college. (noun)

(ii) "Let us honour those who have laid down their lives for the country," said the minister.  
(verb)

**(3) report**

**Ans:-** (i) The class had to hand in their project reports by the end of the week. (noun)

(ii) The witness reported all that he had seen to the lawyer. (verb)

**(4) watch**

**Ans:-** (i) Suman lost her new watch while travelling by train. (noun) (ii) "Watch the house to see if the thief returns," ordered the inspector. (verb)

**(5) form**

**Ans:-** (i) The boy's admission form was rejected by the college as it was incomplete.

(ii) We formed our own impression of the new corporator. (verb)

**(6) surprise**

**Ans:-** (i) "There is a surprise for you outside your door," said my friend. (noun)  
(ii) The villagers surprised the thief when he was sleeping and caught him. (verb)

**Make pairs of sentences of your own, using them as a Noun in one and as a Verb in the other.**

**For example:-** (i) She gave a smile - Noun.  
(ii) Babies smile when they see their mother - Verb.

**2. Say WHY.....**

**(a) Ramanujan's letter bored and irritated Hardy, at first.**

**Ans:-** 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.

**(b) Hardy invited Littlewood for a discussion.**

**Ans:-** 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.

**(c) Mother agreed to send Ramanujan to England.**

**Ans:-** 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, mother agreed to send Ramanujan to England.

**(d) Hardy and Ramanujan could not talk freely with each other.**

**Ans:-** Ramanujan was an untrained genius. There was a big difference in Ramanujan's and Hardy's education. Ramanujan knew nothing of modern rigour; he did not know what a 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.

**(e) Ramanujan had to be hospitalized.**

**Ans:-** Ramanujan had to be hospitalized because he was ill. He later died of tuberculosis.

**(f) Ramanujan found the number 1729 very interesting.**

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

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

**Ans:-** 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.

#### **4 Voice-Active and Passive**

The form of a verb shows whether the doer of an action is in the Subject (Active voice) or the Subject has an action done to it (Passive voice).

**For example:-** The thief stole the jewels. (Active voice).

The jewels were stolen by the thief. (Passive voice)

Note:- While changing from the Active to the Passive voice, the verb form includes be + past participle.

In a sentence, when the doer of an action is significant, we use the Active voice. In the Passive voice the doer of an action may not be mentioned.

**For example:-** The thief was caught. (by the police)

**(A) Underline the verbs in the following sentences and state whether the sentences are in the Active or the Passive voice.**

**(a) England gave Ramanujan great honours.**

**Ans:-** Active

**(b) A large untidy envelope was decorated with Indian stamps.**

**Ans:-** Passive.

**(c) The timetable was not altered.**

**Ans:-** Passive.

**(d) She saw her son in a big hall.**

**Ans:-** Active.

**(e) Hardy corrected his statement.**

**Ans:-** Active.

**(f) Ramanujan was brought to England.**

**Ans:-** Passive.

**(B) Change the voice in the following sentences.**

**(a) Hardy taught Ramanujan.**

**Ans:-** Ramanujan was taught by Hardy.

**(b) He knew nothing of the modern rigour.**

**Ans:-** Nothing of the modern rigour was known by him.

**(c) Sheets of paper were found in it, by Hardy.**

**Ans:-** Hardy found sheets of paper in it.

**(d) Hardy was bored by that manuscript.**

**Ans:-** That manuscript bored Hardy.

**(e) Trinity supported unorthodox talent.**

**Ans:-** Unorthodox talent was supported by Trinity.

**(f) He could not break the ban.**

**Ans:-** The ban could not be broken by him.

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

**(a) When he opened it, he found sheets of paper.**

**Ans:-** Complex.

**(b) He glanced at a letter.**

**Ans:-** Simple.

**(c) Hardy was not only bored but he was also irritated.**

**Ans:-** Compound.

**(d) Ramanujan turned out to be a poor clerk.**

**Ans:-** Simple.

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

**Ans:-** Complex.

**(f) Ramanujan was self-taught : he knew nothing of the modern rigour.**

**Ans:-** Compound.

**6. 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) Greeting.**

**(2) Introduction of the interviewee and achievements.**

**(3) 2 or 3 questions about the 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.**

**Ans:-**

**Interviewer:-** Congratulations Mr. Rohan for winning Mathematics Quiz at National Level.

**Student :-** Thank You so much Madam.

**Interviewer :-** sir how you are feeling after winning this competition?

**Student :-** madam I am very happy today.

**Interviewer:-** sir mathematics is your favourite subject?

**Student:-** yes madam I have my lots of interest in mathematics from my childhood.

**Interviewer:-** yes please encourage other students .

**Student:-** yes I just only want to tell you that do that thing in which you have your interest.  
It will surely leads to success one day