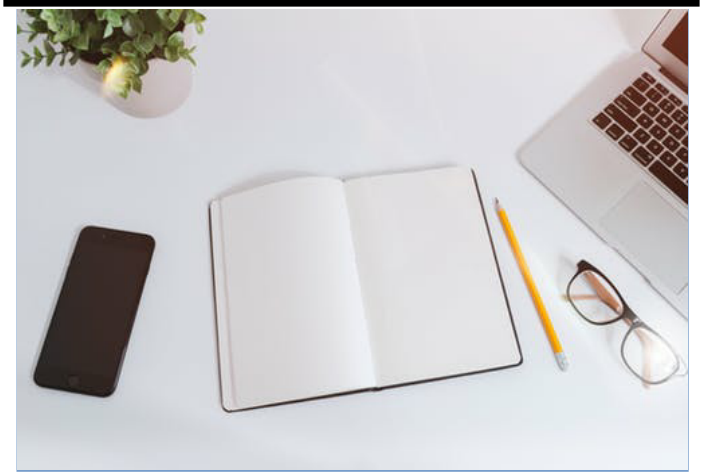
ST.MARY'S PUBLIC SCHOOL

Study Material



Note:-

1. Check the website regularly.
2. Visit relevant subject links.
3. Utilize your time well to explore, learn and share.

ENGLISH LANGUAGE & LITERATURE
Class IX

LITERATURE READER (Beehive)

Prose- L-3 The Little Girl by Katherine Mansfield

Poem 3- Rain on the Roof by Coates Kinney

SUPPLYMENTARY READER (Moments)

L- 3 Iswaran the Storyteller by R. K. Laxman

- Refer **''The English Academy''** on **You Tube** for explanation of the chapters.
- Do NCERT Textbook question answers (Thinking about the Text) of the above-mentioned lessons in a notebook.
- Refer Goyal's Assignments in English.

GRAMMAR SECTION
TENSES

KEY INSTRUCTIONS

- Refer to the given pdf about tenses thoroughly.
- Proceed to the given worksheet and answer all the questions in your notebook.

WORKSHEET

Fill in the correct form of the verb – All tenses

1. They_____in Chicago for 20 years (***be***).
2. I_____a wonderful film in the cinema last night. (***see***)
3. The sun_____at 6:38 yesterday morning (***rise***)
4. The sun_____when the climber reached Mount Everest. (***shine***)
5. I promise that I_____this secret to anyone (***not tell***)
6. Unfortunately, just as we got to the airport their plane_____ off (***take***).
7. They_____to the movies only once in a while (***go***)
8. I was tired yesterday because I_____ well the night before (***not sleep***).
9. Ssshhh… someone_____to our conversation (***listen***)!
10. When I left the house this morning, it_____(***already rain***)
11. I think Bob _____for London this very moment. (***leave***)
12. The plane _____off in a few minutes. (***take***)
13. I_____up at 7 every morning but this morning I_____long and I _____ up until 8. (***get, sleep, not get***)
14. I_____my watch because it is being fixed (***not wear***).
15. This_____ an easy quiz so far (***be***).
16. They_____in an apartment right now because they can't find a cheap house. (***live***)
17. Everyone_____when the earthquake hit the small town. (***sleep***)
18. She_____by herself since her divorce (***live***)
19. I was angry that I_____such a stupid mistake (***make***).
20. I predict that by 2020, man_____on Mars (***land***)
21. He_____his job a couple of years ago. (***quit***)
22. Our daughter _____ from the university.(***graduate***).
23. They_____any Christmas cards last year (***not send***)
24. She_____to a doctor once a year for an examination (***go***)
25. They_____about me when I interrupted their conversation. (***talk***)
26. Nothing much_____when I got to the meeting (***happen***).
27. My parents_____in New York two weeks from today (***be***).
28. I_____two mistakes in the last quiz. (***make***)
29. Unfortunately, our team_____any games last year. (***not win***)

TENSES

Tenses denote the time of action. They show when the work is done. They are:

(1) Present Tense
(2) Past Tense
(3) Future Tense

They are further divided into:

(1) ***Simple Present-*** It is used to denote scientific facts, universal truths and work done on daily basis.

ASSERTIVE RULE --- sub + V1 + s/es + object

Example – She writes a letter.

NEGATIVE RULE --- sub + does not + v1 + s/es + object

Example – She does not write a letter.

INTERROGATIVE RULE --- Does + sub + v1 + s/es + object

Example – Does she write a letter?

INTERROGATIVE NEGATIVE ASSERTIVE --- Does + sub + not + v1 + s/es + object

Example – Does she not write a letter?

(2) ***Present Continuous***– It is used to express an action taking place at the time of speaking.

ASSERTIVE RULE --- sub + is/am/are + v1 + ing + object

Example – she is writing a letter.

NEGATIVE RULE --- sub + is/am/are + not + v1 + ing + object

Example – She is not writing a letter.

INTERROGATIVE RULE --- is/am/are + sub + v1 + ing + object

Example – Is she writing a letter?

INTERROGATIVE NEGATIVE RULE --- is/am/are + sub + not + v1 + ing + object

Example – Is she not writing a letter?

(3) ***Present Perfect***– It is used to show an action that started in the past and has just finished.

ASSERTIVE RULE --- sub + has/have + v3 + object

Example- She has written a letter.

NEGATIVE RULE --- sub + has/have + not + v3 + object

Example – She has not written a letter.

INTERROGATIVE RULE --- has/have + sub + v3 + object

Example- Has she written a letter?

INTERROGATIVE NEGATIVE RULE ---has/have + sub + not + v3 + object

Example– Has she not written a letter?

(4) ***Present Perfect Continuous***– This tense shows the action which started in the past and is still continuing.

ASSERTIVE RULE --- sub + has/have + been + v1 + ing + object

Example – She has been writing a letter.

NEGATIVE RULE --- sub + has/have + not been + v1 + ing + object

Example– She has not been writing a letter.

INTERROGATIVE RULE ---has/have + sub + been + v1 + ing + object

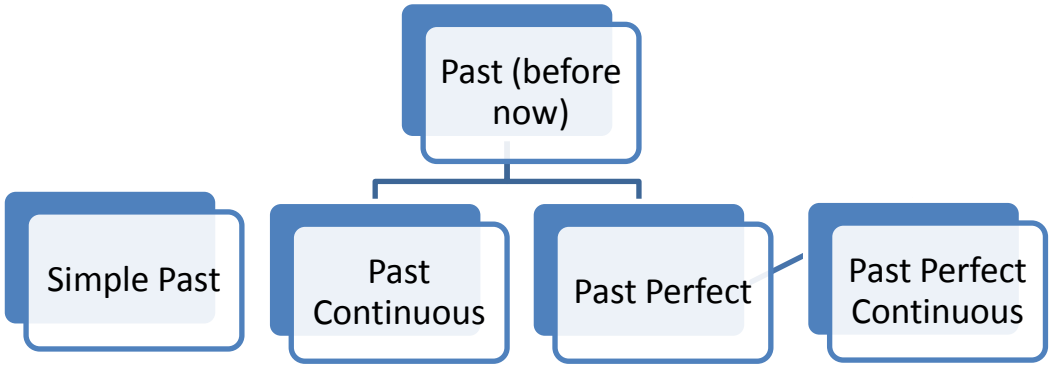
Example – Has she been writing a letter?

INTERROGATIVE NEGATIVE RULE --- has/have + she + not + been + v1 + ing + object

Example – Has she not been writing a letter?

Past Tense

Tense symbolizes the ever moving, non-stop wheel of time which is forever busy gathering moments of future and throwing them into the dustbin of past



Simple Past

Used to indicate an action completed in the past. It often occurs with adverb of time. Sometimes it is used without an adverb of time.

Used for past habits.

Eg. I played football when I was a child.

Rule: **Subject + V2**

Eg She wrote a letter

1. Assertive Sentences –
   Subject + V2 + Object + (.)
   She wrote a letter.
2. Negative Sentences-
   Subject + didn't + V1 + Object + (.)
   She didn't.write a letter.
3. Interrogative Sentences-
   Did + Subject + V1 + Object + (?)
   Did she write a letter?

4. Interrogative Negative Sentences-
   Did + Subject + not + V1 + Object + (?)
   Did she not write a letter?

Past Continuous Tense

Used to denote an action going on at some time in the past.

e.g. I was driving a car.

Rule: was/were + ing

1. Assertive Sentences –
   Subject + was/were +V1+ ing + Object + (.)
   She was writing a letter.
2. Negative Sentences-
   Subject + was/were + not + ing + Object + (.)
   She was not writing a letter.
3. Interrogative Sentences-
   Was/were + Subject + ing+ Object + (?)
   Was she writing a letter?
4. Interrogative Negative Sentences-
   Was/were + Subject + not + ing+ Object + (?)
   Was she not writing a letter?

Past Perfect Tense

Used to describe an action completed before a certain moment in the past, usually a long time ago. If two actions happened in the past, past perfect is used to show the action that took place earlier.

e.g. The patient had died before the doctor came.

1. Assertive Sentences –
   Subject + had + V3 + Object + (.)
   She had written a letter.
2. Negative Sentences-
   Subject + had + not + Object + (.)
   She had not written a letter.

3. Interrogative Sentences-
   Had + Subject + V3 + Object + (?)
   Had she written a letter?
4. Interrogative Negative Sentences-
   Had + Subject + not + V3 + Object + (?)
   Had she not written a letter?

Past Perfect Continuous Tense

Used to denote an action that began before a certain point in the past and continued up to some time in past.

e.g. I had been learning English in this school for 20 days.

1. Assertive Sentences –
   Subject + had been +V1 + ing + Object + (.)
   She had been writing a letter.
2. Negative Sentences-
   Subject + had + not been + V1+ ing + Object + (.)
   She had not been writing a letter.
3. Interrogative Sentences-
   Had + Subject+ been+ V1 + ing + Object + (?)

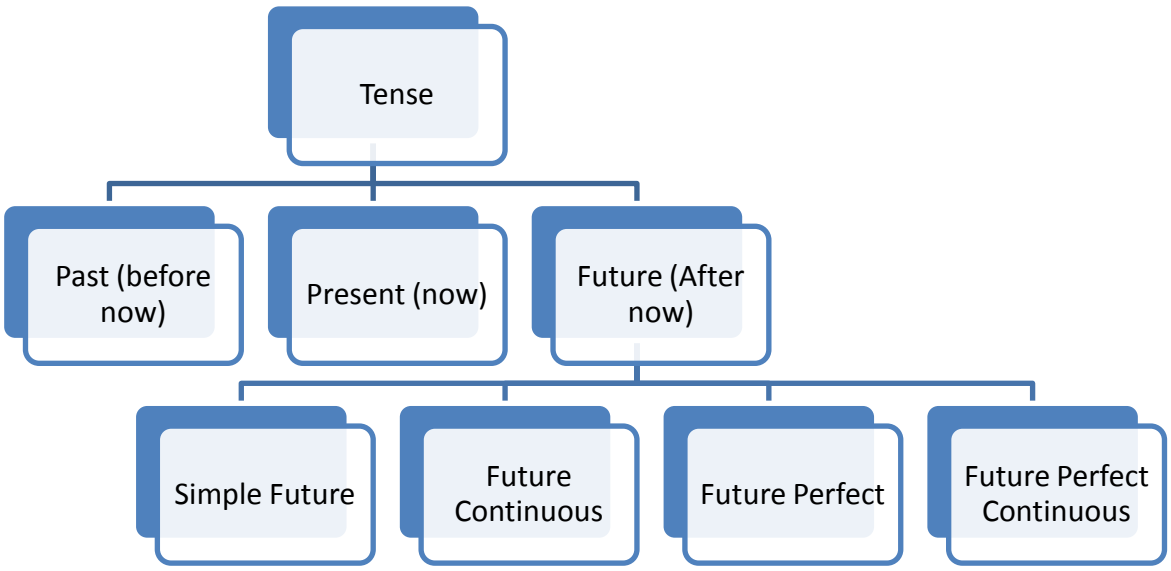
   Had she been writing a letter?

4. Interrogative Negative Sentences-
   Had + Subject +not + been + V1 + ing + Object + (?)
   Had she not been writing a letter?

FUTURE TENSE

Time and tide wait for no man. So, a period of time following the moment of speaking or writing is called as future tense.

For e.g- She will write a letter.



Simple Future

This tense tells us about an action which has not occurred yet and will occur after saying or in future

Rule – **Will/Shall + Verb (Ist form)**

In Future Tense helping verb ‘Shall’ is used with ‘I’ and ‘We’. Helping verb ‘Will’ is used with all others. When you are to make a commitment or warn someone or emphasize something, use of 'will/shall' is reversed. ‘Will’ is used with ‘I’ & ‘We’ and 'shall' is used with others.

In general speaking there is hardly any difference between 'shall & will' and normally ‘Will’ is used with all.

Now, let us use this rule in various forms of sentences;

1. Positive / Affirmative Sentences –
   Subject + Will/Shall + Verb (Ist form) + Object + (.)
   She will write a letter.
2. Negative Sentences-
   Subject + Will/Shall + Not + Verb (Ist form) + Object + (.)
   She will not write a letter.
3. Interrogative Sentences-
   Will/Shall + Subject + Verb (Ist form) + Object + (?)
   Will she write a letter?
4. Interrogative Negative Sentences-
   Will/Shall + Subject + Not + Verb (Ist form) + Object + (?)
   Will she not write a letter?

Future Continuous Tense

It is used to express an ongoing or continued action in future.
e.g. He will be distributing sweets in temple tomorrow at 12 o'clock.
In the example, the action will start in future (tomorrow) and action is thought to be continued till sometime in future.

We use the future continuous to talk about something that will be in progress at or around a time in the future.

Rule: **Will/Shall + Be + Verb (Ist form) + Ing**

Now, let us use this rule in various forms of sentences;

1. Positive / Affirmative Sentences –
   Subject + Will/Shall + Be + Verb (Ist form) + Ing + Object + (.)
   She will be writing a letter.
2. Negative Sentences-
   Subject + Will/Shall + Not + Be + Verb (Ist form) + Ing + Object + (.)
   She will not be writing a letter.
3. Interrogative Sentences-
   Will/Shall + Subject + Be + Verb (Ist form) + Ing + Object + (?)

Will she be writing a letter?

4. Interrogative Negative Sentences-
   Will/Shall + Subject + Not + Be + Verb (Ist form) + Ing + Object + (?)
   Will she not be writing a letter?

Future Perfect Tense

It is used to express an action which will happen/occur in future and will be completed by a certain time in future.

We use the future perfect to say that something will be finished by a particular time in the future.

e.g. They will have shifted the house by Sunday morning.

Rule: **Will/Shall + Have + Verb (3rd form)**

Now, let us use this rule in various forms of sentences;

1. Positive / Affirmative Sentences –
   Subject + Will/Shall + Have + Verb (3rd form) + Object + (.)
   She will have written a letter.
2. Negative Sentences-
   Subject + Will/Shall + Not + Have + Verb (3rd form) + Object + (.)
   She will not have written a letter.
3. Interrogative Sentences-
   Will/Shall + Subject + Have + Verb (3rd form) + Object + (?)
   Will she have written a letter?
4. Interrogative Negative Sentences-
   Will/Shall + Subject + Not + Have + Verb (3rd form) + Object + (?)
   Will she not have written a letter?

Future Perfect Continuous Tense

It is used to talk about actions that will commence at a fix time in future and will continue for some time in future.

If there is no time reference, then it is not a Future perfect continuous tense. Without continued time reference, such sentences are Future Continuous Tense. Continued time reference only differentiates between Future Continuous Tense and Future Perfect Continuous Tense.

The future perfect progressive emphasize the duration of an activity that will be in progress before another time or event in the future.

e.g. This time tomorrow, I will be enjoying the cricket match in the stadium.

It is also used to talk about planned actions or actions expected to happen.

e.g. They will be staying for a week's

The future perfect progressive emphasize the duration of an activity that will be in progress before another time or event in the future.

Rule: **Will/Shall + Have been + Verb (Ist form) + Ing**

Now, let us use this rule in various forms of sentences;

1. Positive / Affirmative Sentences –
   Subject + Will/Shall + Have been + Verb (Ist form) + Ing + Object + (.)
   She will have been writing a letter.
2. Negative Sentences-
   Subject + Will/Shall + Not + Have been + Verb (Ist form) + Ing + Object+ (.)
   She will not have been writing a letter.
3. Interrogative Sentences-
   Will/Shall + Subject + Have been + Verb (Ist form) + Ing + Object +(?)
   Will she have been writing a letter?
4. Interrogative Negative Sentences-
   Will/Shall + Subject + Not + Have been + Verb (Ist form) + Ing + Object +(?)
   Will she not have been writing a letter?

Question 1: 'मानसरोवर' से कवि का क्या आशय है? हिन्दी कक्षा 9

उत्तर: यहाँ पर 'मानसरोवर' से कवि ने ऐसी स्थिति को समझाने की कोशिश की है जिसमें आदमी सुखी रहता है और उस सुख को न छोड़ने के लोभ में वहाँ से निकलना ही नहीं चाहता है।

Question 2: कवि ने सच्चे प्रेमी की क्या कसौटी बताई है?

उत्तर: कवि ने भक्त को सच्चा प्रेमी कहा है। एक सच्चे प्रेमी की तरह एक भक्त भी बिना कुछ पाने की लालसा लिये अपने आराध्य की आराधना करता है। वह किसी सच्चे प्रेमी की तरह अपने प्रेम में पूरी तरह समर्पि रहता है।

Question 3: तीसरे दोहे में कवि ने किस प्रकार से ज्ञान को महत्व दिया है?

उत्तर: कवि का मानना है कि ज्ञान मिलना बहुत कठिन होता है क्योंकि अक्सर लोग सही ज्ञान को पहचान ही नहीं पाते हैं। यहाँ पर ज्ञान को किसी दूर की कौड़ी की तरह बताया गया है।

Question 4: इस संसार में सच्चा संत कौन कहलाता है?

उत्तर: सच्चा संत वही होता है जो पक्षपात से दूर होता है। उसे किसी पक्ष विशेष की चिंता नहीं होती है। बल्कि वह निष्पक्ष होकर अपने काम में तल्लीन होता है।

Question 5: अंतिम दो दोहों के माध्यम से कबीर ने किस तरह की संकीर्णताओं की ओर संकेत किया है?

उत्तर: इन दोहों में कवि ने धर्म की संकीर्ण परिभाषा की ओर संकेत किया है। कवि का मानना है कि भले ही धर्म अलग-अलग हों लेकिन सबका मकसद एक ही होता है और वह है ईश्वर से मिलन।

Question 6: किसी भी व्यक्ति की पहचान उसके कुल से होती है या उसके कर्मों से? तर्क सहित उत्तर दीजिए।

उत्तर: किसी भी व्यक्ति की पहचान उसके कुल से नहीं बल्कि उसके कर्मों से होती है। इतिहास में ऐसे कई उदाहरण भरे पड़े हैं जिनमें किसी निर्धन परिवार में जन्मे व्यक्ति ने अपने अच्छे कर्मों से अपना नाम रोशन किया है। दूसरी ओर ऐसे भी उदाहरण हैं जहाँ किसी राजपुत्र ने अपने गलत कर्मों की वजह से अपने राजवंश की सत्ता का ह्रास किया है।

Question 7: काव्य सौंदर्य स्पष्ट कीजिए:
हस्ती चढ़िए ज्ञान कौ, सहज दुलीचा डारि।
स्वान रूप संसार है, भूँकन दे झख मारि।

उत्तर: इस दोहे में कवि ने सरल बोलचाल की भाषा का प्रयोग किया है। कवि ने एक प्रचलित मुहावरे की मदद से एक गूढ़ विषय को समझाने की कोशिश की है। इस कविता में उपमा का प्रचुर प्रयोग हुआ है।

Question 8: मनुष्य ईश्वर को कहाँ कहाँ ढूँढ़ता फिरता है?

उत्तर: मनुष्य ईश्वर को मंदिर, मस्जिद, मजार, चर्च, गुरुद्वारा, मजार और तीर्थस्थानों में ढूँढ़ता फिरता है।

Question 9: कबीर ने ईश्वर प्राप्ति के लिए किन प्रचलित विश्वासों का खंडन किया है?

उत्तर: कबीर ने ईश्वर के प्राप्ति के कई प्रचलित विश्वासों का खंडन किया है। कवि ने बताया है कि मंदिर, मस्जिद या तीर्थस्थलों पर जाने से कुछ नहीं मिलता। कवि ने यह भी बताया है कि बिना मतलब के आडंबरों या पूजा पाठ से कुछ भी हासिल नहीं होता।

Class IX, Science

Chapter 5: Fundamental unit of Life

Video link:
https://www.youtube.com/watch?v=XBc-XA1JEq4&feature=youtu.be

Cell
It is the structural and functional unit of life.

- **Cell is termed as the structural unit of life as it** provides structure to our body.
- **Cell is considered as the functional** unit of life as all the functions of the body take place at cell level.

Discovery of cell:

- Discovered by Robert Hooke in 1665.
- Robert Brown in 1831 discovered the nucleus in the cell.

Cell Theory:
Cell theory states that:

- All living organisms are composed of cells.
- Cell is the fundamental unit of life.
- All new cells come from pre-existing cells.

Types of Organisms on the Basis of Number of Cells
There are two kinds of organisms on the basis of cells:

(i) Unicellular Organisms: The organisms that are made up of single cell and may constitute a whole organism, are named as unicellular organisms.
For example: Amoeba, Paramecium, bacteria, etc.

(ii) Multicellular Organisms: The organisms which are composed of a collection of cells that assume function in a coordinated manner, with different cells specialized to perform particular tasks in the body, are named as multicellular organisms.
For example: Plants, human beings, animals, etc.

Shape and Size of Cells

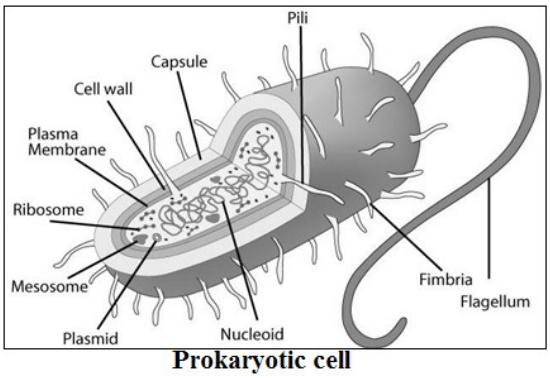
- Cells vary in shape and size. They may be oval, spherical, rectangular, spindle shaped, or totally irregular like the nerve cell.
- The size of cell also varies in different organisms. Most of the cells are microscopic in size like red blood cells (RBC) while some cells are fairly large like nerve cells.

Types of Cells

The cells can be categorized in two types:

1. Prokaryotic Cell 2. Eukaryotic Cell

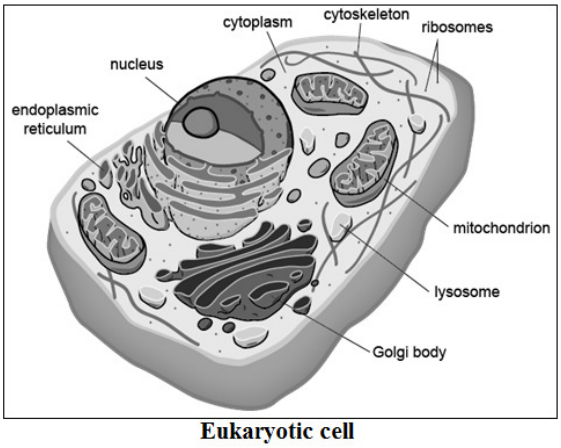
1. Prokaryotic cell



Prokaryotic cell

Prokaryotic cells are cells in which true nucleus is absent. They are primitive and incomplete cells. Prokaryotes are always unicellular organisms. For example, archaebacteria, bacteria, blue green algae are all prokaryotes.

2. Eukaryotic Cell



Eukaryotic cell

Eukaryobc cells are the cells in which true nucleus is present. They are advanced and complete cells. Eukaryotes include all living organisms (both unicellular and multicellular organisms) except bactera and blue green algae.

Difference Between Prokaryotic and Eukaryotic Cells:

S. No.	Prokaryotic cell	Eukaryotic cell
1.	Size of cell is generally small (1-10 mm).	Size of cell is generally large (5-100 mm).
2.	Nucleus is absent.	Nucleus is present.
3.	It contains single chromosome.	It contains more than one chromosome.
4.	Nucleolus is absent.	Nucleolus is present.
5.	Memrane bound cell organelles are absent.	Memrane bound cell organelles such as mitochondria, plastids, endoplasmic reticulum, golgi apparatus, lysosomes, etc., are present.
6.	Cell division takes place by fission or budding.	Cell division takes place by mitotic or meiotic cell division.

Structure of Cell

Cell is generally composed of three basic components:
(i) Cell wall and cell membrane
(ii) Nucleus
(iii) Cytoplasm

(i) Cell membrane or Plasma membrane:

Plasma membrane is the covering of the cell that separates the contents of the cell from its external environment.
It is a living part of the cell and is present in cells of plants, animals and microorganisms.
It is very thin, delicate, elastic and selectively permeable membrane.
It is composed of lipid and protein.

Function:

As it is selectively permeable membrane, it allows the flow of limited substances in and out of the cell.

(ii) Cell wall:

cell wall is non-living, thick and freely permeable covering made up of cellulose.
It is present in eukaryotic plant cells and in prokaryotic cells.

Functions:

- It determines the shape and rigidity to the plant cell.
- It protects the plasma membrane.
- It prevents desiccation or dryness in cell.
- It helps in the transport of varous substances in and out of the cell.

(iii) Nucleus:

Nucleus is dense and spherical organelle.
Nucleus is bounded by two membranes, both forming nuclear envelope. Nuclear envelope contains many pores known as nuclear pores.
The fluid which present inside the nucleus is called nucleoplasm.
Nucleus contains chromosomes and chromosomes contain genes which are the centres of genetic information.

Functions:

- Nucleus controls all the metabolic activities of the cell.
- It regulates the cell cycle.
- Nucleus is the storehouse of genes.It is concerned with the transmission of hereditary traits from the parent to offspring.

(iv) Cytoplasm:

It is a jelly-like, viscous, colourless semi-fluid substance that occurs between the plasma membrane and the nuclear membrane.

The aqueous ground substance of cytoplasm is called cytosol that contains a variety of cell organelles and other insoluble waste products and storage products, like starch, glycogen, lipid, etc.

Functions:

• Protoplasm acts as a store of vital chemicals like amino acids, proteins, sugars, vitamins, etc.
• It is the site of certain metabolic reactions, like glycolysis, synthesis of fatty acids, nucleotides, etc.

Cell organelles:

Inside the cell there are different parts performing different activities to keep the cell alive anf functionable. These part are called Cell organelles. They are explained below:

1. Golgi Apparatus:

Golgi apparatus consists of a set of membrane bound, fluid filled vesicles, vacuoles and flattened cisternae (closed sacks).

Cisternae are usually arranged parallel to each other.

Functions:

- Its main function is to store, modify, package and dispatch the substances.
- It is also involved in the synthesis of cell wall, plasma membrane and lysosomes.

2. Endoplasmic Reticulum:

It is a membranous network of tube like structures extending from nuclear membrane to plasma membrane.

It is absent in prokaryotic cells and matured RBCs of mammals.

There are two types of endoplasmic reticulum:
(i) Rough Endoplasmic Reticulum (RER): Here ribosomes are present on the surface for the synthesis of proteins.
(ii) Smooth Endoplasmic Reticulum (SER): Here ribosomes are absent and is meant for secreting lipids.

Functions:

- It gives internal support to cell.
- It helps in transport of various substances from nuclear membrane to plasma membrane or vice versa.
- RER helps in synthesis and transportation of proteins.
- SER helps in synthesis and transportation of lipids.

3. Ribosomes:

These are extremely small, dense and spherical bodies which occur freely in the matrix (cytosol) or remain attached to the endoplasmic reticulum.

These are made up of ribonucleic acid (RNA) and proteins.

Function:
They play a major role in the synthesis of proteins.

4. Mitochondria:

They are small rod-shaped organelles.
It is a double membrane structure with outer membrane being smooth and porous whereas inner membrane being thrown into a number of folds called cristae.
They contain their own DNA and ribosomes.
They are absent in bacteria and red blood cells of mammals.

Functions:

- They are the sites of cellular respiration, hence provide energy for the vital activities of living cells.
- They store energy releases during reactions, in the form of ATP (Energy currency of the cell). Therefore, they are also called 'power house' of the cell.

5. Centrosome and Centrioles:

Centrosome is found only in eukaryotic animal cells. It is not bounded by any membrane but consists of centrioles.
Centroles are hollow cylindrical structures arranged at right angle to each other and made up of microtubules.

Function:
Centrioles help in cell division and also help in the formation of cilia and flagella.

6. Plastids:

Plastids are present in most of the plant cells and absent in animal cells.
They are usually spherical or discoidal in shaped and double membrane bound organelles.
They also have their own DNA and ribosomes.
Plastids are of three types: **(a) Chloroplasts:** These are the green coloured plastids containing chlorophyll. Chloroplasts aid in the manufacture food by the process of photosynthesis. **(b) Chromoplasts:** These are the colourful plastids (except green colour). **(c) Leucoplasts:** These are the colourless plastids.

Function:

- Chloroplasts trap solar ebergy and utilise it to manufacture food for the plant.

- Chromoplasts impart various colours to flowers to attract insects for pollination.
- Lecuoplasts help in the storage of food in the form of starch, proteins and fats.

7. Lysosomes:

Lysosomes are small, spherical, sac like structures which contain several digestive enzymes enclosed in a membrane.
They are found in eukaryotic cells mostly in animals.

Functions:

- Lysosomes help in digestion of foreign substances and worn-out cell organelles.
- They provide protection against bacteria and virus.
- They help to keep the cell clean.
- During the disturbance in cellular metabolism, for example when the cell gets damaged, lysosomes may burst and the enzymes digest their own cell. Therefore, lysosomes are also known as **suicide bags** of a cell

8. Vacuoles:

Vacuoles are liquid/solid filled and membrane bound organelles.
In plant cells, vacuoles are large and permanent. In animal cells, vacuoles are small In size and temporary.
In mature plant cell, It occupies 90% space of cell volume.
Due to its size, other organelles, including nucleus shift towards plasma membrane.

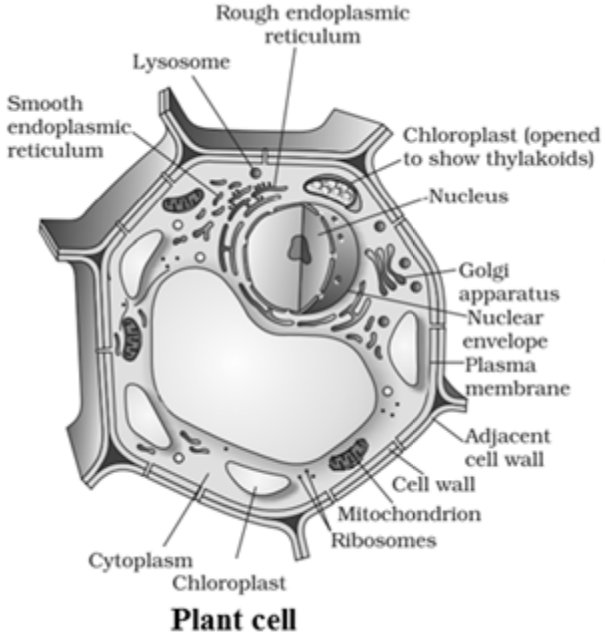
Function:

- They help to maintain the osmotic pressure in a cell.
- They provide turgidity and rigidity to the plant cell.

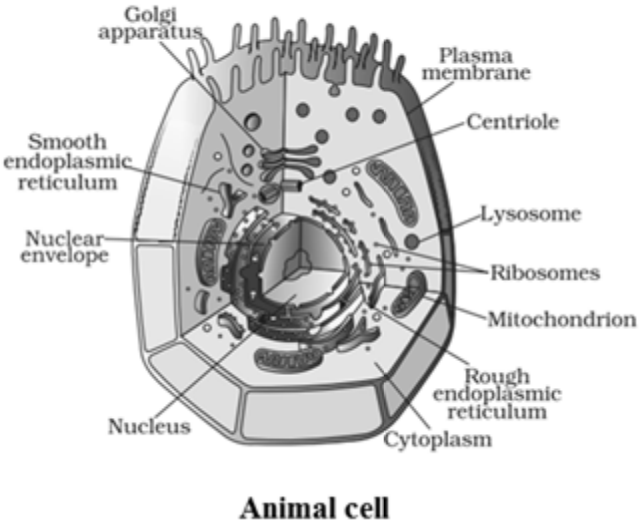
Difference Between Animal Cell and Plant Cell:

S. No.	Animal cell	Plant cell
1.	Animal cells are generally small in size.	Plant cells are larger than animal cells.
2.	Cell wall is absent.	Plasma membrane of plant cell is surrounded by a rigid cell wall of cellulose.
3	Plastids are absent except in case of protozoan Euglena.	Plastids are present.
4.	Here vacuoles are many, small and temporary.	They have a permanent and large central sap vacuole.
5.	They have centrosome and centrioles.	They lack centrosome and centrioles.

Structure of Plant cell and Animal cell:



Plant cell



Animal cell

Answer the following:

1. Name two cell organelle which is able to destroy a damaged cell.
2. State two function of the nucleus of a cell.
3. Explain the difference between Prokatyotic and Eukaryotic cell.
4. Name the two structures found in animal cell and not in plant cells.
5. Difference between plant cell and animal cell.
6. Explain the term ATR
7. What is Plasmolysis?
8. What is isotonic solution?
9. If the swollen raisin is put into salt solution, what will happen?
10. Why are Lysosomes known as suicide bags?
11. Which cell organelle is also known as the ‘power house of the cell’ and why?
12. Draw a plant cell and animal cell.
13. Difference between smooth and rough endoplasmic reticulum.
14. Why the Ribosomes are called ‘protein factories’?
15. Function of Mitochondria, Endoplasmic recticulum and Golgi apparatus.

CLASS - IX , SOCIAL SCIENCE

CHAPTER -1,ECONOMICS : THE STORY OF VILLAGE PALAMPUR

ASSIGNMENT

- Palampur is a hypothetical village and farming is the main activity in the village.
- This village has about 450 families belonging to several different castesThe 80 upper caste families own the majority of land in the village.
- Most of the houses have electric connections. Electricity powers all the tubewells in the fields and is used in various types of small businesses.
- Palampur is a modern village. Palampur has fairly well developed system of roads, transport, electricity, irrigation, schools and health centre.

ORGANISATION OF PRODUCTION:

- The first requirement is land and other natural resources such as water, forest and animals.
- The second requirement is Labour i.e, the people who will do work.
- The third requirement is physical capital - the items come under physical capital are:

a) Fixed capital: Tools, machines, buildings can be used in production over many years and are called fixed capital.

b) Working capital: Raw material and money in hand. Money is always required during production to make payments and buy other necessary items.

- The fourth requirement is human capital. Human capital is able to put together land, labour and physical capital.

FARMING IN PALAMPUR:

- Land is fixed.
- During the rainy season (kharif) farmers grow jowar and bajra.
- In the winter season (rabi) fields are sown with wheat.
- In palampur farmers are able to grow three different crops in a year.
- To grow more than one crop on a piece of land during the year is known as MULTIPLE CROPPING.
- The Green Revolution in the late 1960s introduced the Indian farmers to the cultivation of wheat and rice using high yielding varieties (hyvs) of seeds.
- By modern farming methods, the same piece of land would now produce far larger quantities of food grains.
- Draw picture - 1.4 - Modern farming methods : Hyv seeds, chemical fertilizer, etc.

- Farmers of Punjab, Haryana and Western Uttar Pradesh were the first to try out the modern farming method in India.
- Green Revolution is associated with the loss of soil fertility due to increased use of chemical fertilizers.
- Continuous use of ground water for tubewellirrigaton has led to the deplition of the water table.
- Large and medium farmers sell the surplus farm products. A part of the earnings is saved and kept for buying capital for the next season.
- Small farmers depend on large farmers for their captal for the next season.

NON - FARM ACTIVITIES:

- Dairy
- Small scale manufacturing
- Shopkeeping
- Transport
- Tailoring
- Teaching
- Doctors

CLASS 9 MATHS
CHAPTER 1

Introduction to Natural Numbers

Natural Numbers: Counting numbers are known as natural numbers thus 1, 2, 3, 4,.....,etc., are all natural numbers.

Whole Numbers

All natural numbers including zero are called **Whole Numbers**.

W = 0, 1, 2, 3, 4, 5, …….

Integers

All natural numbers, negative numbers and 0, together are called **Integers**.

Z = – 3, – 2, – 1, 0, 1, 2, 3, 4, ……

Rational Numbers

The number ‘a’ is called **Rational** if it can be written in the form of r/s where ‘r’ and ‘s’ are integers and s ≠ 0,

Q = 2/3, 3/5, etc. all are rational numbers.

How to find a rational number between two given numbers?

To find the rational number between two given numbers ‘a’ and ‘b’.

$$\frac{a+b}{2}$$

Example:

Find 2 rational numbers between 4 and 5.

Solution:

To find the rational number between 4 and 5

$$\frac{a+b}{2}=\frac{4+5}{2}=\frac{9}{2}$$

To find another number we will follow the same process again.

$$\frac{1}{2}\left(4+\frac{9}{2}\right)=\left(\frac{1}{2}\right)\frac{17}{2}=\frac{17}{4}$$

Hence the two rational numbers between 4 and 5 are 9/2 and 17/4.

The other option is by multiplying and dividing the two given rational numbers by atleast 1 more than the number of rational numbers we have to find. For Example:

Suppose we have to find 6 rational numbers between 3 and 4 so we will multiply and divide 3 and 4 by (n+1) i.e. (6+1) in this case

So now 3 and 4 can be represented as $\frac{21}{7}$ and $\frac{28}{7}$ respectively.

Now rational numbers between 3 and 4 are

$$\frac{22}{7}, \frac{23}{7}, \frac{24}{7}, \frac{25}{7}, \frac{26}{7}, \frac{27}{7}$$

Concept Insight: Since there are infinite number of rational numbers between any two numbers so the answer is not unique here. The trick is to convert the number to equivalent $\frac{p}{q}$ form by multiplying and dividing by the number atleast 1 more than the rational numbers to be inserted.

Q.Find 5 rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$

There are infinite rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$

$$\frac{3}{5} = \frac{3\times10}{5\times10} = \frac{30}{50}$$
$$\frac{4}{5} = \frac{4\times10}{5\times10} = \frac{40}{50}$$

Now rational numbers between are $\frac{3}{5}$ and $\frac{4}{5}$

$$\frac{31}{50}, \frac{32}{50}, \frac{33}{50}, \frac{34}{50}, \frac{35}{50}$$

Concept Insight: Since there are infinite number of rational numbers between any two numbers so the answer is not unique here. The trick is to convert the number to equivalent $\frac{p}{q}$ form by multiplying and dividing by the number at least 1 more than the rational numbers required.

TRY THESE

Q. Find 5 Rational Numbers b/w

1. $\frac{8}{5}$ **and** $\frac{9}{5}$
2. 1 and 2
3. $-\frac{3}{11}$ **and** $\frac{8}{11}$

Irrational Numbers

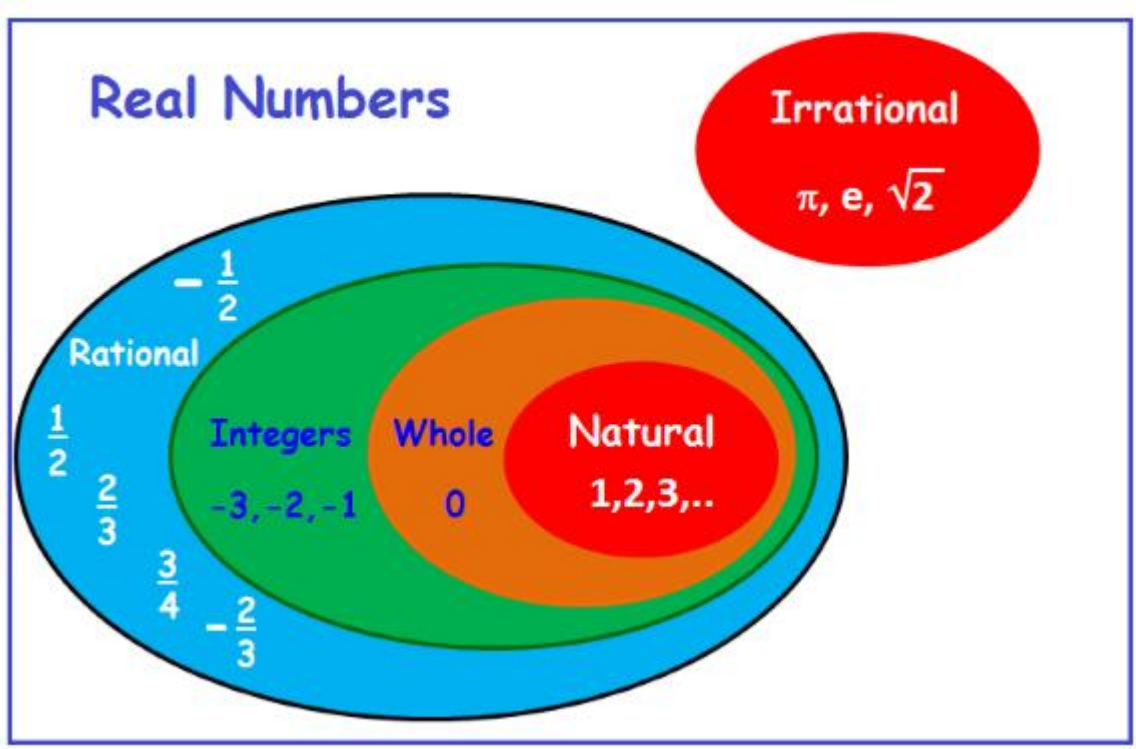
The number 'a' which cannot be written in the form of p/q is called irrational, where p and q are integers and q ≠ 0 or you can say that the numbers which are not rational are called **Irrational Numbers**.

Example - √7, √11 etc.

Real Numbers

All numbers including both rational and irrational numbers are called **Real Numbers**.

R = – 2, – (2/3), 0, 3 and √2



Real Numbers and their Decimal Expansions

1. Rational Numbers

If the rational number is in the form of a/b then by dividing a by b we can get two situations.

a. If the remainder becomes zero

While dividing if we get zero as the remainder after some steps then the decimal expansion of such number is called terminating.

Example:

7/8 = 0.875

b. If the remainder does not become zero

While dividing if the decimal expansion continues and not becomes zero then it is called non-terminating or repeating expansion.

Example:

1/3 = 0.3333….

It can be written as $0.\overline{3}$

Hence, the decimal expansion of rational numbers could be terminating or non-terminating recurring and vice-versa.

2. Irrational Numbers

If we do the decimal expansion of an irrational number then it would be **non –terminating non-recurring** and vice-versa. i. e. the remainder does not become zero and also not repeated.

Example:

π = 3.14159265358979323……

Expressing Decimals as rational numbers

Case 1 – Terminating Decimals

Q.

Write the following in decimal form and say what kind of decimal expansion each has:

(i) 15/100

(ii) 1/9

(iii) 2/11

(iv) 3/13

Answer

i)	15/100	0.15 (Terminating)
ii)	1/9	0.111111... (Non terminating repeating)
iii)	2/11	.18181818....(Non terminating repeating)
iv)	3/13	0.230769230769... = 0.230769 (Non terminating repeating)

Case 2: Recurring Decimals

i) $0.\overline{6}$

(ii) $0.4\overline{7}$

(iii) $0.\overline{001}$

Ans. Solution:

(i) $\text{Let } x = 0.\overline{6} \Rightarrow x = 0.6666.....(a)$

We need to multiply both sides by 10 to get

$10x = 6.6666.....$ $....(b)$

We need to subtract (a)from (b), to get

$$\begin{array}{l} 10x = 6.6666..... \\ \underline{-\ x = 0.6666.....} \\ 9x = 6 \end{array}$$

We can also write $9x = 6$ as $x = \frac{6}{9}$ or $x = \frac{2}{3}$.

Therefore, on converting $0.\overline{6}$ in the $\frac{p}{q}$ form, we get the answer as $\frac{2}{3}$.

(ii) $\text{Let } x = 0.4\overline{7} \Rightarrow x = 0.47777.....(a)$

We need to multiply both sides by 10 to get

$10x = 4.7777.....(b)$

We need to subtract (a)from (b), to get

$$\begin{array}{l} 10x = 4.7777..... \\ \underline{-\ x = 0.4777....} \\ 9x = 4.3 \end{array}$$

We can also write $9x = 4.3$ as $x = \frac{4.3}{9}$ or $x = \frac{43}{90}$.

Therefore, on converting $0.4\overline{7}$ in the $\frac{p}{q}$ form, we get the answer as $\frac{43}{90}$.

(iii) Let $x = 0.\overline{001} \Rightarrow x = 0.001001.....(a)$

We need to multiply both sides by 1000 to get

$1000x = 1.001001.....$ $....(b)$

We need to subtract (*a*)from (*b*), to get

$$\begin{array}{r} 1000x = 1.001001..... \\ -\ x = 0.001001.... \\ \hline 999x = 1 \end{array}$$

We can also write $999x = 1$ as $x = \frac{1}{999}$.

Therefore, on converting $0.\overline{001}$ in the $\frac{p}{q}$ form, we get the answer as $\frac{1}{999}$.

All natural numbers, negative numbers and 0, together are called Integers.

Pythagoras theorem to locate an irrational number √n on the real number line:
Video Link:

https://www.youtube.com/watch?v=cpWiKVEMl3g

All students MUST watch this video to make this topic more clear.

representation of irrational numbers on the number line.

To have better understanding of the concept lets take an example of representation of square root of 2 (2–√2) on the number line. For the representation following steps must be followed:

Step I: Draw a number line and mark the centre point as zero.

Step II: Mark right side of the zero as (1) and the left side as (-1).

Step III: We won't be considering (-1) for our purpose.

Step IV: With same length as between 0 and 1, draw a line perpendicular to point (1), such that new line has a length of 1 unit.

Step V: Now join the point (0) and the end of new line of unity length.

Step VI: A right angled triangle is constructed.

Step VIII: Now length of hypotenuse found by applying pythagoras theorem.

Locate $\sqrt{2}$ on the number line

For drawing $\sqrt{2}$ we consider Pythagoras theorem.

As $1 + 1 = 2$
$1^2 + 1^2 = 2$
$\sqrt{1^2 + 12} = \sqrt{2}$

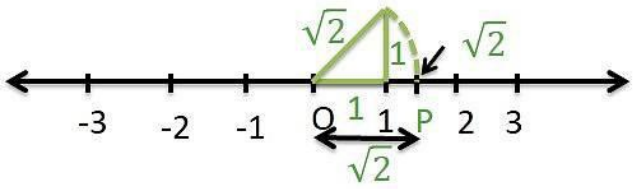
Using Pythagoras theorem

$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Height}^2$

$\text{Hypotenuse} = \sqrt{\text{Base}^2 + \text{Height}^2}$

$\text{Hypotenuse} = \sqrt{1^2 + 1^2}$

$\text{Hypotenuse} = \sqrt{2}$



Point P is the point of $\sqrt{2}$

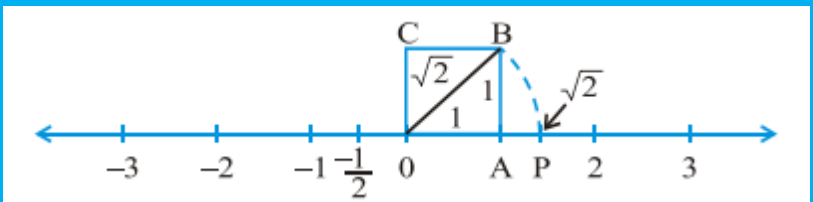
Step IX: Now with hypotenuse as radius and (0) as the centre cut an arc on the same number line and name the point as P.

Step X: Since hypotenuse is the radius of the arc and hence, 0P will also be the radius of the arc whose length is √2.
Step XI: Hence, P is the representation of √2 on the number line.

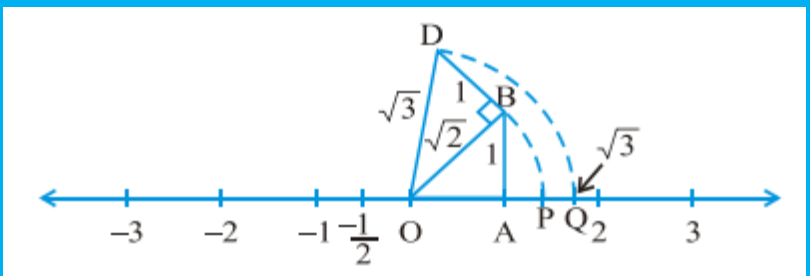
(ii) Locating √n point on number line for already drawn √n-1:

***For Example*:** Locate √3 on the number line.

(i) In this case, we will locate √2 on number as shown in the above example.



(ii) For already drawn √2, draw unit perpendicular length BD to OB. Now, keeping O as centre draw an arc from point D which will intersect the number line at Q.



(iii) In the figure, OQ represents √3.

Q.Draw √2,√3 and √5 on number line

Q. Do Q1,Q3,Q4,Q9 of Ex1.3

Q1. https://www.youtube.com/watch?v=U1wJn2Eaox4

Q3. https://www.youtube.com/watch?v=N3ui-p9UDRE

Q4. https://www.youtube.com/watch?v=fFNYIUNqCvs

Q9. https://www.youtube.com/watch?v=WD6jtd_VdTU

Representing Real Numbers on the Number Line

To represent the real numbers on the number line we u se the process of successive magnification in which we visualize the numbers through a magnifying glass on the number line.

Example:

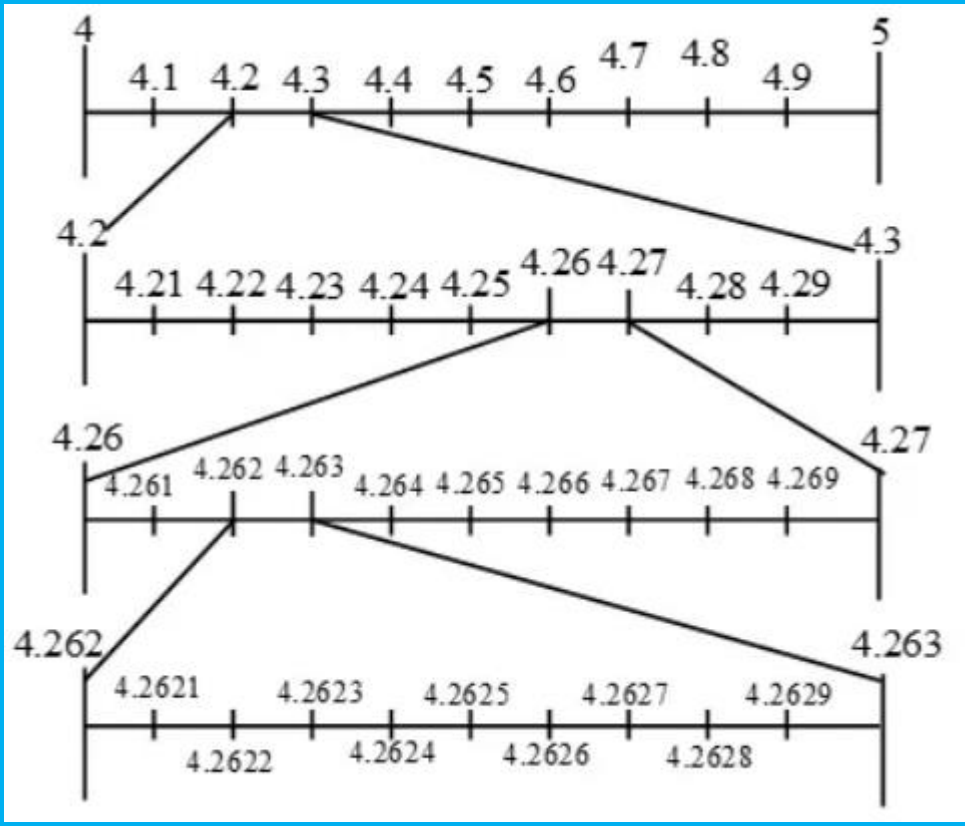
Mark $4.\overline{26}$ on the number line up to 4 decimal places.

Step 1: The number lies between 4 and 5, so we divide it into 10 equal parts. Now for the first decimal place, we will mark the number between 4.2 and 4.3.

Step 2: Now we will divide it into 10 equal parts again. The second decimal place will be between 4.26 and 4.27.

Step 3: Now we will again divide it into 10 equal parts. The third decimal place will be between 4.262 and 4.263.

Step 4: By doing the same process again we will mark the point at 4.2626.



Link: https://www.youtube.com/watch?v=JCoaNQTPMBU

NOTE: Topic existence of √x for given positive real number x and its representation on the number line with geometric proof is deleted as per CBSE curriculum.

Operations on Real Numbers

1. The sum, difference, product and quotient of two rational numbers will be rational.

Example:

$$\Rightarrow \frac{3}{4}+\frac{7}{4}=\frac{10}{4}=\frac{5}{2}$$

$$\Rightarrow \frac{7}{4}-\frac{3}{4}=\frac{4}{4}=1$$

$$\Rightarrow \frac{7}{4}\times\frac{3}{4}=\frac{21}{16}$$

$$\Rightarrow \frac{7}{4}\div\frac{3}{4}=\frac{7}{3}$$

2. If we add or subtract a rational number with an irrational number then the outcome will be irrational.

Example:

If 5 is a rational number and √7 is an irrational number then 5 + √7 and 5 - √7 are irrational numbers.

3. If we multiply or divide a non-zero rational number with an irrational number then also the outcome will be irrational.

Example:

If 7 is a rational number and √5 is an irrational number then 7√7 and 7/√5 are irrational numbers.

4. The sum, difference, product and quotient of two irrational numbers could be rational or irrational.

Example:

$\sqrt{3}+\sqrt{3}=2\sqrt{3}$ (irrational + irational = irrational)

$\sqrt{2}-\sqrt{2}=0$ (irrational – irrational = rational)

$(\sqrt{6}).(\sqrt{6})=6$ (irrational × irrational = rational)

$\frac{\sqrt{13}}{\sqrt{13}}=1$ (irrational ÷ irrational = rational)

Identities Related to Square Roots

If p and q are two positive real numbers

1. $\sqrt{pq}=\sqrt{p}\sqrt{q}$
2. $\sqrt{\frac{p}{q}}=\frac{\sqrt{p}}{\sqrt{q}}$
3. $(\sqrt{p}+\sqrt{q})(\sqrt{p}-\sqrt{q})=p-q$
4. $(p+\sqrt{q})(p-\sqrt{q})=p^2-q$
5. $(\sqrt{p}+\sqrt{q})(\sqrt{r}+\sqrt{s})=\sqrt{pr}+\sqrt{ps}+\sqrt{qr}+\sqrt{qs}$
6. $(\sqrt{p}+\sqrt{q})^2=p+2\sqrt{pq}+q$

Examples:

1. Simplify $(3+\sqrt{7})(5-\sqrt{11})$

We will use the identity]

$(\sqrt{p}+\sqrt{q})(\sqrt{r}+\sqrt{s})=\sqrt{pr}+\sqrt{ps}+\sqrt{qr}+\sqrt{qs}$

$(3+\sqrt{7})(5-\sqrt{11})=15+5\sqrt{7}+3\sqrt{11}+\sqrt{77}$

2. Simplify $(\sqrt{5}+\sqrt{11})(\sqrt{5}-\sqrt{11})$

We will use the identity

$(\sqrt{p}+\sqrt{q})(\sqrt{p}-\sqrt{q})=p-q$

$(\sqrt{5}+\sqrt{11})(\sqrt{5}-\sqrt{11})=5-11=-6$

VIDEO LINK:
https://www.youtube.com/watch?v=ABEdV2-AX7c

Rationalizing the Denominator

Rationalize the denominator means to convert the denominator containing square root term into a rational number by finding the equivalent fraction of the given fraction.

For which we can use the identities of the real numbers.

Example:

Rationalize the denominator of 7/(7- √3).

Solution:

We will use the identity $(p+\sqrt{q})(p-\sqrt{q}) = p^2 - q$ here.

$$\frac{7}{7-\sqrt{3}} \times \frac{7+\sqrt{3}}{7+\sqrt{3}} = \frac{7(7+\sqrt{3})}{49-3} = \frac{49+7\sqrt{3}}{46}$$

VIDEO LINK:

https://www.youtube.com/watch?v=jvoPwSQM4WY

Laws of Exponents for Real Numbers

If we have a and b as the base and m and n as the exponents, then

1. $a^m \times a^n = a^{m+n}$
2. $(a^m)^n = a^{mn}$
3. $\frac{a^m}{a^n} = a^{m-n}, m > n$
4. $a^m b^m = (ab)^m$

5. $a^0 = 1$
6. $a^1 = a$
7. $1/a^n = a^{-n}$

- Let a > 0 be a real number and n a positive integer.

$$\text{Then } \sqrt[n]{a} = b, \text{ if } b^n = a \text{ and } b > 0$$

$$\sqrt[n]{a} = a^{\frac{1}{n}}$$

- Let a > 0 be a real number. Let m and n be integers such that m and n have no common factors other than 1, and n > 0. Then,

$$a^{\frac{m}{n}} = \left(\sqrt[n]{a}\right)^m$$

Example:

Simplify the expression $(2x^3y^4)\ (3xy^5)^2$.

Solution:

Here we will use the law of exponents

$a^m \times a^n = a^{m+n}$ and $(a^m)^n = a^{mn}$

$(2x^3y^4)(3xy^5)^2$

$(2x^3y^4)(3^{\ 2}\ x^{\ 2}\ y^{10})$

$18.\ x^3.\ x^2.\ y^4.\ y^{10}$

$18.\ x^{3+2}.\ y^{4+10}$

$18x^5y^{14}$

VIDEO LINK :

https://www.youtube.com/watch?v=JMnm6xeHC58

HOMEWORK

Understand the concept and do all the examples given in the chapter .

Also do the following exercises in your maths copy:

Ex1.1

Ex1.2 upto 3

Ex1.3 (Except Q1, Q3,Q4 and Q9 as already done above)

Ex1.5

THANKYOU