

**KENDRIYA VIDYALAYA UDUPI**  
**SUMMER VACATION HOLIDAY HOMEWORK**  
**[03-05-2021 TO 20-06-2021]**

**CLASS : IX**  
**हिंदी**

- दो बैलों की कथा पाठ का सारांश अपने शब्दों में लिखें ।।
- एक प्रोजेक्ट फ़ाइल ( पोर्टफोलियो ) का निर्माण जिसमें निम्न कार्य शामिल हों  
(. किसी भी एक कवि का जीवन परिचय देते हुए उसका साहित्यिक परिचय लिखें ।  
(. उपसर्ग और प्रत्यय की परिभाषा लिखते हुए दो -दो उदाहरण लिखें ।  
(. वर्तमान समय में कोरोना की भयावह स्थिति पर एक अनुच्छेद लिखें।  
(. अपने छोटे भाई को जो पढाई के लिए घर से दूर रहता है उसे कोरोना सचेत रहते हुए तथा बचाव के उपाय बताते हुए एक पत्र लिखिए ।  
(. विद्यालय के हिंदी पखवाड़ा कार्यक्रम पर अपने दोस्त के साथ एक संवाद लिखिए ।  
(. मेरे आदर्श शिक्षक अथवा हिंदी भाषा के महत्व पर एक निबंध लिखें ।

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**SANSKRIT**

1. Write the shabdaroopani of 'बालक' 'बालिका' 'पुष्प' 'कवि' 'गुरु' and 'अस्मद्' 'युष्मद्' . Also write 'तत्' and 'किम्' shabda in all three gender types.
2. Write the word forms of 'कृ/पठ्' and 'लभ्' dhaatu in 5 tenses. (लट् लृट् लङ् लोट् and विधिलिङ्लकार)
3. Learn all the word-forms by-heart.

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**SCIENCE**

1. Learn all intext and out text question answers of chapter number 1, 5 and 8 and complete written work also in notebook.
- 2 . Write practical no 1 ,2,3,4,5,6,&7 in your practical record book.
3. Draw fig. no. (1.5),(1.7),(1.9)of chapter 1,fig. no.(5.3),(5.5)(5.6)of chapter 5 &fig.no ,(6.2),(6.3)(6.4),(6.7),(6.10),(6.11),(6.12)of Chapter 6 and graphs of chapter 8 in your holiday home work notebook.
4. Write answers of CCT questions in your Pisa notebook ( CCT questions are available in Google classroom).
5. Prepare a power point presentation on biodiversity of Karnataka/covid-19.

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**SOCIAL STUDIES**

- 1.Prepare 20 questions and answers of 1 mark each from history chapter 2, in your H.W. notebook.
2. **Make a list of states of India showing the following points. Capital city, Language spoken, dance forms, famous religious place.**

STATE	CAPITAL CITY	LANGUAGE SPOKEN	DANCE FORM	RELIGIOUS PLACE
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- 3.On outline map of world colour and label the continents and oceans and also mark the following countries

India, Mexico, Zimbabwe, Canada, France Germany, Japan China, United Kingdom, United States of America, Italy,

4. Write fundamental rights and duties neatly in your claswork notebook.
5. Define the following geographical terms in your C.W. notebook neatly.  
PLATEAU, MARSH, MOUNTAIN RANGE , {RIVER }MOUTH, OASIS, SWAMP, ALTITUDE, FLOOD PLAIN, VALLEY, TUNDRA SEACOAST, TROPICS, PORT, CHANNEL TIDES, INLET, HARBOR, GLACIER, ICEBERG, OCEAN, SEA GULF, CHANNEL, BAY, LAKE, STRAIT, TRIBUTARY, RIVER BASIN,DELTA,DAM,

CLASS IX READING LITERACY

**PART A**

**Musical Instruments to Play**

A musical instrument is a device created to make musical sounds. Anything that makes a sound can be used as a musical instrument. The history of musical instruments goes back to the beginning of culture. People first used instruments as ritual: a hunter might use a trumpet to signal a successful hunt; a drum might be used in a religious ceremony.



Cultures later composed and performed a set of sounds called a melody for entertainment. Musical instruments were needed. Some historians report that the earliest musical instrument was a simple flute. Many of the earliest musical instruments were made from animal skins, bone, wood, and other non-durable materials. Musical instruments were developed separately in the different countries and regions of the world, but when civilizations shared information amongst themselves, the development of instruments spread. For example, cultures of North America, South America, and Central America used similar instruments and shared these ideas of making instruments that were alike in some way.

Many different ways have been used to classify instruments over the years. One way to classify instruments is to put them in groups by the range of music the instruments can play. Another classification is to put them together by what they are made out of. However, the most common method of grouping instruments is by how they produce sounds. The academic study of musical instruments is called organology. Woodwinds and brass (sometimes called the "wind" instruments), string, percussion, electric, and keyboard are types of instruments grouped according to how they are made and the range of music and sounds they play.

Woodwind and brass instruments include the trumpet, clarinet, flute, oboe, trombone, tuba, and harmonica. Stringed instruments include the banjo, guitar, harp, violin, and viola. Percussion instruments include the cymbal, chime, timpani, drum, and tambourine. Electronic instruments are the keyboard and the synthesizer. Keyboard instruments include the accordion, organ, and piano. Maybe you will play an instrument someday. Will it be a woodwind or brass, stringed, percussion, electronic or a keyboard instrument?



**A. Matching.** Draw a line to connect which musical instruments belong to the categories listed in the story.

- |                       |                             |
|-----------------------|-----------------------------|
| 1. woodwind and brass | a) banjo, guitar, harp      |
| 2. stringed           | b) trumpet, clarinet, flute |
| 3. percussion         | c) keyboard, synthesizer    |
| 4. keyboard           | d) accordion, organ, piano  |
| 5. electronic         | e) cymbal, chime, drum      |

**B. Phonics work.**

The word "electronic" in the story ends in the letters "ic" that make a short "i" sound followed by a "k" sound. Write another word that has the "ic" letters to make the "ik" sound (a short i followed by the k sound).

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The letter "y" in the word "history" is changed to "i" when adding the suffix "an", which means "of". So a "historian" is someone "of history", an "Italian" is someone "of Italy", etc. Write another word that has the "an" suffix. Write what the word means.

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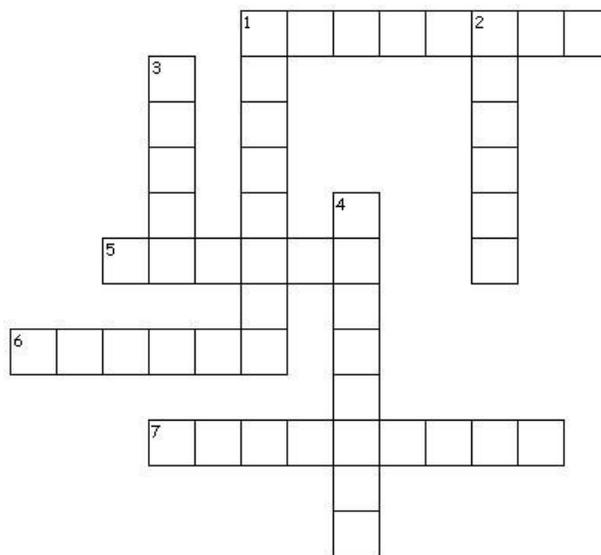
**C. Crossword.** Use these words to solve the musical clues:

device, signal, ceremony, composed, performed, melody, classify, range

**Across**

- 1. formed; made up of
- 5. something invented, devised, fitted
- 6. sweet music
- 7. played

- Down**
- 1. to group according to some system
  - 2. a sign giving warning or notice
  - 3. the distance between; extent
  - 4. a special act done on special occasions



**D. Multiple-Choice Questions** (Circle the correct answer.)

1. The text mentions that musical instruments are made out of all of these materials except \_\_\_\_\_.

- a. animal skin
- b. bone
- c. rock
- d. wood

2. According to the text, what is the most common way of grouping instruments?

- a. by range of music played
- b. what they are made out of
- c. how they look
- d. how they produce sounds

3. According to the text, what was the earliest reported instrument?

- a. a simple piano
- b. a simple flute
- c. a simple guitar
- d. a simple harp

**E. Extended Response (Answer in complete sentences.)**

1. How does the text define "musical instrument"?

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2. Explain at least two ways early instruments were used.

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3. What did early cultures of people do to foster and encourage music?

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4. Name two instruments which you think were first played in your country.

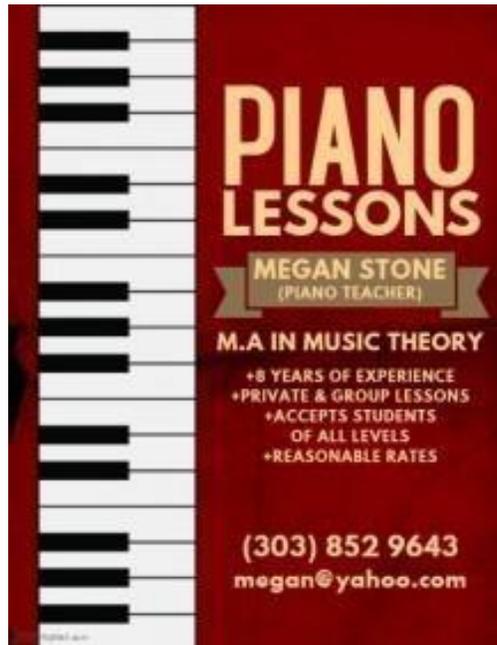
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F. Write the word from para 2 which means the same as 'similar'.

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**PART B** This is an advertisement in the form of a poster.



1. Who do you think has paid for this poster?

.....

2. Why has the teacher got these posters made?

.....  
.....

3. What is her contact no.?

.....

4. What makes the teacher special?

a) .....

b) .....

5. If you were in her place, what would you do to promote your classes?

.....  
.....

6. Name three places in the school where you think this poster should be displayed.

**PART C This is the location of a musical instrumental store:**



**Furtados**    [234 Google reviews](#)

Musical instrument store in Chandigarh, India

**Address:** S.C.F. No - 21, Ground Floor Inner Market, Sector 7-C, Chandigarh, 160019  
**Hours:**

**Closed** · Opens 10:30AM

- Tuesday 10:30am–8pm
- Wednesday 10:30am–8pm
- Thursday 10:30am–8pm
- Saturday 10:30am–8pm
- Sunday 10:30am–8pm
- Monday 10:30am–8pm

Thanks for your feedback.

**Phone:** 0172 437 1675

**Website:** <http://www.furtadosonline.com/>

**Category:** Musical instrument store

[Suggest an edit](#)

Questions & answers

[Ask a question](#)

Q: Can I get musical instruments by credit card?

A: Yes

**Based on the visual input and the given information, answer the following questions.**

Q.1. Which musical instrument store is being highlighted here?

.....

Q.2. What is the address of this music store?

.....

.....

Q.3. In case of a query, how would you contact the store?

a).....

b) .....

Q.4. You are in Sector 17 right now and have to buy a guitar urgently. Which store would you go to? Why?

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.....  
.....  
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Q.5. When is the store closed for the whole day?

Why do you think it is not closed on the weekend?

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**PART D**

If you could play any instrument, what would it be? Why do you think you would choose that particular instrument?

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- a) Reporting time and pick up time are .....
- i) 9 am and 5pm
  - ii) 9 am and 4.30 pm
  - iii) 8 am and 5 pm
  - iv) 8 am and 4.30 pm
- b) 11 am on Friday, the child would be .....
- i) at the Pacific Community Pool
  - ii) park
  - iii) taking dance lessons
  - iv) enjoying the field trip
- c) A group of 7 students enrolled themselves for 3 days, how much fees did they pay?
- d) How do such camps benefit a student's health? ( give one reason)
- e) What is the compulsory instruction of the camp officials regarding payment?
- f) If the camp organiser wishes to organise a Spell Bee Competition, which days would he keep in mind?

## Unit 1 : For the Love of Books

Old books have a unique smell. If you don't believe that, check out some old books at your home or in the library. They will certainly smell good!

Tarun asked 60 students in his school about their favourite category of books. He represented the information using a pictogram.



Genre of book		Frequency
Non-Fiction		
Science fiction		10
Poetry		
Humour		
Horror		8
Adventure		14

Key: represents ..... books.

The science fiction row in the pictogram is complete.

- 1.1 Now, why don't you complete the key.
- 1.2 Complete the pictogram as well.
- 1.3 What is the mode of the given frequency table ?  
(Hint: book liked by maximum number of students)

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- 1.4 How many more students prefer adventure books to humour books?

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The typical smell is due to the breakdown of two chemical components of paper-cellulose and lignin. In fact, the chemicals responsible for the smell of a book can be used to figure out its age, just like carbon dating.



## Unit 2 : Homeward Bound

Geetali is travelling back home by train from Mumbai to Pune.



- 2.1 The price of a ticket is Rs.1350. Geetali being a student gets a rebate of one-third on her ticket. Calculate the amount that she pays for her ticket.

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- 2.2 Geetali travels by two trains. The first train goes from Mumbai to Lonavala. The second train goes from Lonavala to Pune. Look at some information that she has written down about the schedule of the trains.

### First train

Mumbai	departs	13 45 hrs.
Lonavala	arrives	16 39 hrs.

### Second train

Lonavala	departs	17 12 hrs.
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Express the time 13 45 hrs. using the 12-hour clock.

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2.3 Find the time that the first train would take to travel from Mumbai to Lonavala. Give your answer in hours and minutes.

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2.4 The first train arrives 46 minutes late at Lonavala. By how many minutes has Geetali missed her second train?

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2.5 The next train from Lonavala to Pune is at 18 12 hrs. The journey is 76 km and the train travels at an average speed of 48km/h. Find the time at which the train arrives in Pune.

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**Mumbai local trains: Facts that'll blow your mind!**

- The Mumbai suburban railway system is spread over 400 km.
- It carries more than 7.5 million commuters daily.
- The railway tracks are silent only for about 90 minutes a day.
- Without the Mumbai local trains, many Mumbaikars would go hungry, thanks to the dabbawallahs who bank on these locals to operate one of the most enterprising food delivery system.



## Unit 3 : Prize Money

Three school students Ved, Mallika and Juhi bagged the First Prize in a model making competition based on Artificial Intelligence. The prize money of Rs. 18000 was distributed equally among them by the Principal.



**3.1** Ved spends 40% of his prize money of Rs 6000. He spends the money in the following ratio:- clothes : books : music CDs = 10 : 2 : 3.

(i) Find the amount he spends on music CDs.

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(ii) Find out how much more he spends on clothes as compared to books.

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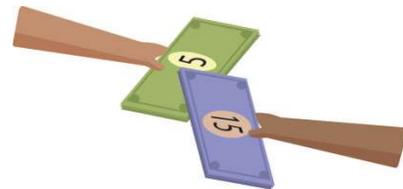
**3.2** Malika invests her Rs.6000 for 1 year at a rate of 4% per year simple interest. Calculate the interest Malika receives at the end of the first year.

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- 3.3** Juhi goes on holiday to Europe with her family and converts her Rs. 6000 into euros (€). She spends €25 to buy souvenirs for her friends. When she gets home, she changes the remaining euros into Indian Rupees. The exchange rate was €1 = Rs 80. Find the amount of money that she is left with.



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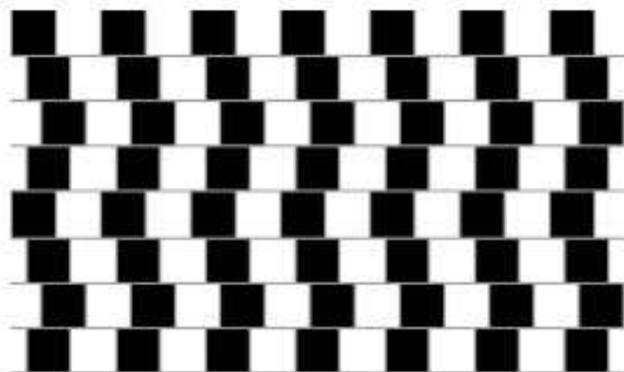
**Whoever said money can't buy happiness simply didn't know about the prize money of these shows!**

- Kaun Banega Crorepati- The prize money of the show was raised from Rs. 1 crore in season 1 to Rs. 7 crores in season 7.
- Bigg Boss- Rs. 50 lakhs cash prize.
- Indian Idol- The winner gets a chance to create own music album along with a prize money of Rs. 25 lakhs.
- Master Chef India- Rs. 25 lakhs cash prize.



## Unit 4 : Optical Illusions

Optical Illusions are arrangements of images and colour to create interesting visual effects. Let's see one to experience it.



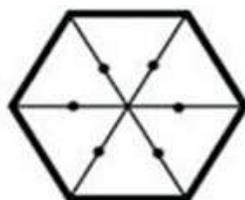
Now, let's create one-

**Step 1.** Draw a regular hexagon of convenient size. A **regular figure** is a figure in which all the sides are equal and all the interior angles are also equal.

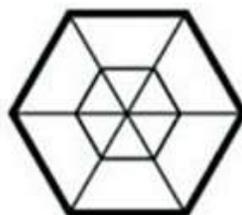
For example, an equilateral triangle is a **regular shape** because all the sides are equal and all the angles are equal.



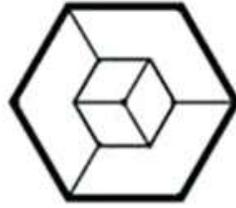
**Step 2.** Mark midpoints on each line as shown in the figure.



**Step 3.** Connect the points as shown below.



**Step 4.** Erase those lines as shown in the fig below.



**Step 5.** Now colour according to your own choice, keeping in mind the different shades. You can use three different colours or three different shades of the same colour to colour each pair of opposite side.



Now you look at the cube that you have just created.

**4.1** What is the ratio of the surface areas of the smaller cube and the bigger cube?

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**4.2** What is the ratio of the volumes of the smaller cube and the bigger cube?

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**4.3** What would be the changes in the ratios of volumes, instead of midpoints, you take the points  $1/3$  and  $1/4$  distance from the center?

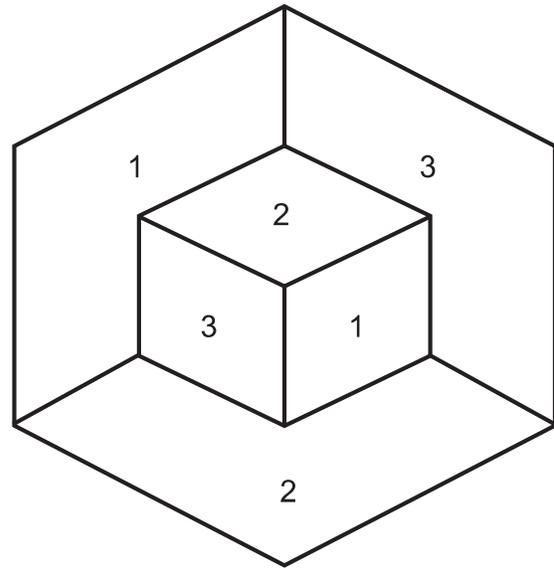
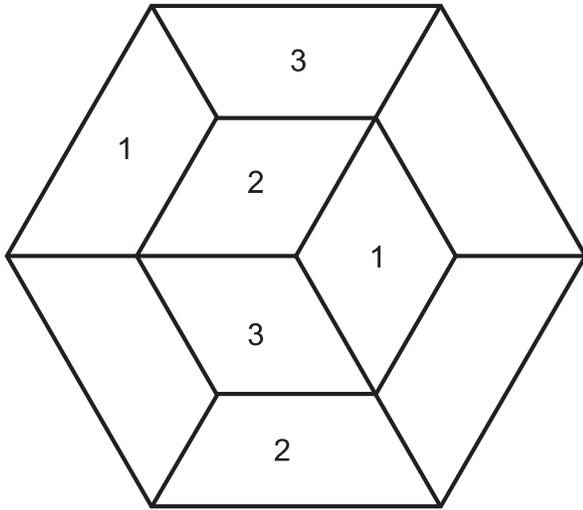
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## Creative Corner

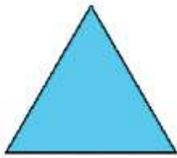
A few figures for you to explore your artistic side. Choose any 3 colours of your choice. Colour the areas which have the same number, in the same shade.



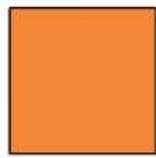
## Unit 5 : Shapes and Patterns

Let's explore our creative side by learning how to inscribe and circumscribe regular figures using geometrical constructions.

Regular Figures or Regular Polygons are those which are equiangular (all angles equal), as well as equilateral (all sides equal). For example,



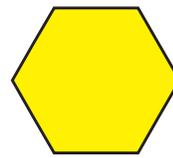
Triangle



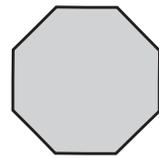
Square



Pentagon



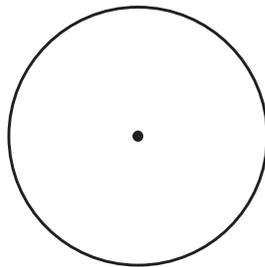
Hexagon



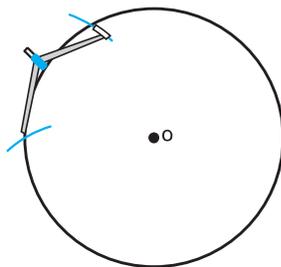
Octagon

### 5.1 Let's learn to inscribe a regular hexagon in a circle. Follow the instructions and create your own regular hexagon.

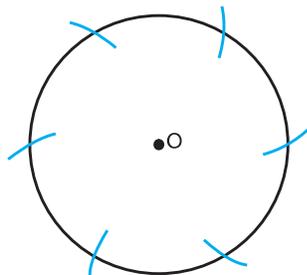
**Step 1 :** Draw a circle of a suitable radius.



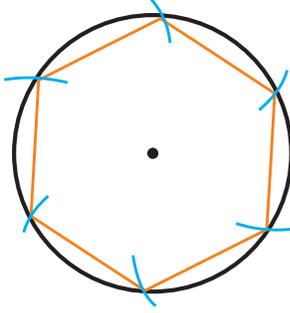
**Step 2 :** Without changing the radius and keeping the needle of the compasses on the circumference (boundary) draw a small arc on the circle.



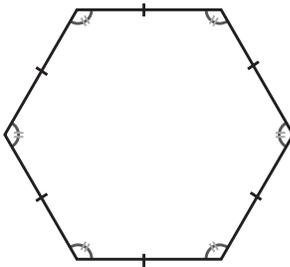
**Step 3 :** Again, with the same radius draw arcs on the circle, as shown in the figure, till you reach the first arc.



**Step 4 :** Join the points marked by the arcs.



**Step 5 :** Erase the circle outside.



*Hexagon is Ready!*

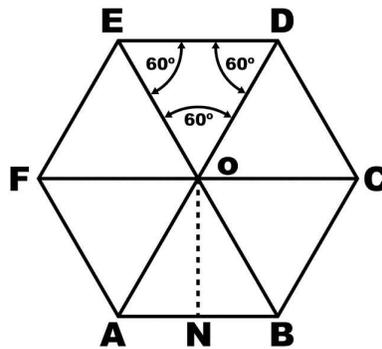
(a) Given the radius of the circle, how will you find the area of the inscribed hexagon?

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(b) Find the areas of both the circle and the hexagon.

(Hint: What kind of triangle is  $\triangle EOD$ ?)



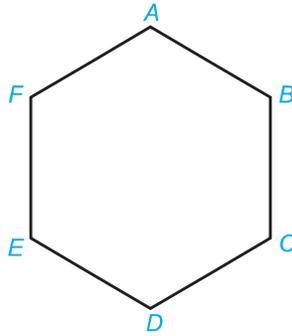
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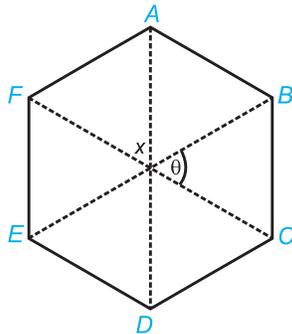
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## 5.2 How to inscribe a circle inside a hexagon:

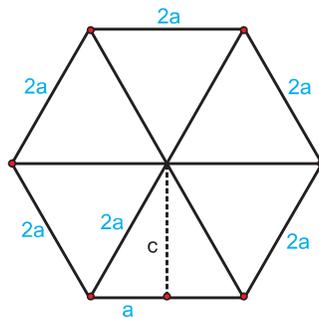
**Step 1 :** Draw a hexagon.



**Step 2 :** Join AD, BE & CF. These are called the main diagonals of a hexagon.

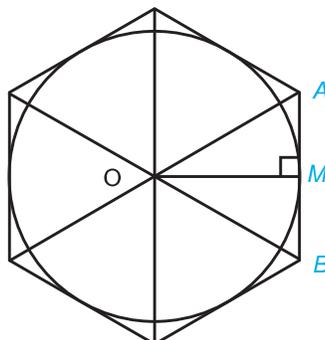


**Step 3 :** Draw the apothem  $c$  from the centre of the hexagon to a side.



*New Word!*  
Apothem – A perpendicular from the center of a regular polygon to any of its side.

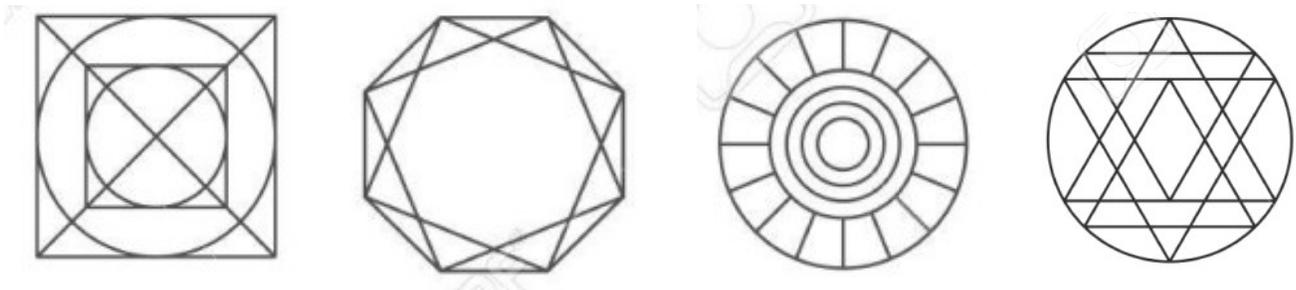
**Step 4 :** With the apothem as the radius and centre as O, draw a circle as shown below.



*Circle is Ready!*

## Creative Corner

- (a) Draw 2 circles, one circumscribing and one inscribed in the same hexagon.  
(b) Create more such patterns and colour them.



### The hexagon is everywhere!

The simple hexagon with six sides is actually fascinating. And, if you look closely, you will find it in many places!

- The eyes of a dragonfly are a collection of tiny eyes called compound eyes, each forming the shape of a hexagon.
- Carbon has a molecular structure of a hexagon too.
- You must have seen the hexagonal nuts and bolts. This shape makes the tools grip the bolt easily.

And finally, your pencil : check, if it too has a hexagonal shape.



## Unit 6 : Honeybees and their Family Tree

There are over 30,000 species of bees and most of these bee species live solitary lives. However, the one that we know best, honeybee, lives in a colony called a beehive and they have a unique family tree.



In a colony of honeybees, there is one special female called the queen.



There are many worker bees who are females as well, but unlike the queen bee, they produce no eggs.



There are some drone bees who are males and do no work.

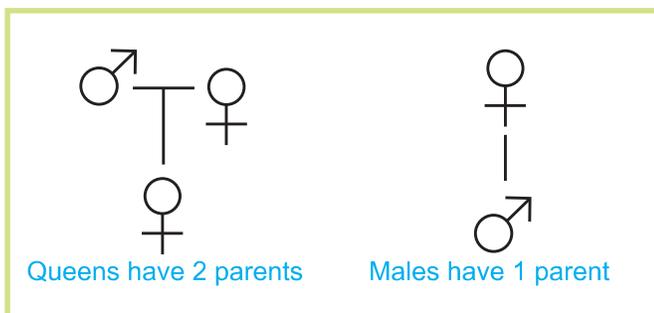


Males are produced by the queen's unfertilized eggs, so male bees only have a mother but no father!



All the females are produced when the queen has mated with a male and so they have two parents. Females usually end up as worker bees but some are fed with a special substance called royal jelly which makes them grow into queens ready to go off to start a new colony when the bees form a swarm and leave their home (a hive) in search of a place to build a new nest.

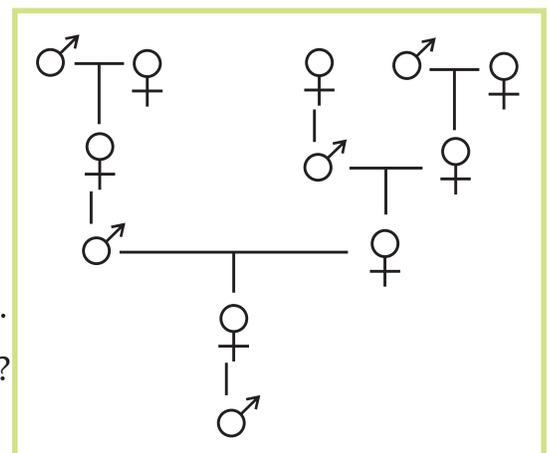
So female bees have 2 parents, a male and a female. Whereas, male bees have just one parent, a female.



Here we follow the convention of family trees that parents appear above their children, so the latest generations are at the bottom and the higher we go, the older people are. Such trees show all the ancestors (predecessors, forebears, antecedents) of the person at the bottom of the diagram.

Let's look at the family tree of a male drone bee.

1. He had 1 parent, a female.
2. He has 2 grand-parents, since his mother had two parents, a male and a female.
3. He has 3 great-grand-parents: his grand-mother had two parents but his grand-father had only one.
4. How many great-great-grand parents did he have?



Number of	Parents	Grand Parents	Great Grand Parents	Great Great Grand Parents	Great Great Great Grand Parents
<b>Male Bee</b>	1	2	3	5	8
<b>Female Bee</b>	2	3	5	8	13

Now if you notice the family tree of a bee follows the **Fibonacci Sequence**.

A Fibonacci sequence is a sequence of numbers where after the first two terms, each term is the sum of the previous two terms.

e.g. 2, 3, 5, 8, 13, .....

$$5 = 2 + 3, \quad 8 = 3 + 5, \quad 13 = 5 + 8$$

Fibonacci Numbers occur at an amazing number of places. They are very common in plants.

Here is a daisy with 21 petals (but expect a few more or less, because some may have dropped off or are just growing)



**6.1** Write down the next three terms of this Fibonacci sequence.

5, -1 4, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**6.2** For the Fibonacci sequence

4, -3, 1, -2, -1, -3, -4, .....

Show that the sum of the first six terms is equal to four times the fifth term.

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**KENDRIYA VIDYALAYA UDUPI**  
**SUMMER VACATION HOLIDAY HOMEWORK**  
**[03-05-2021 TO 20-06-2021]**

**CLASS : X**

**हिंदी**

- **क्षितिज पाठ्यपुस्तक के अध्याय 1 और 2 के सभी प्रश्नोत्तर याद करें।**
- **एक प्रोजेक्ट फ़ाइल ( पोर्टफोलियो ) का निर्माण जिसमें निम्न कार्य शामिल हों**
  - (. गोस्वामी तुलसीदास का जीवन परिचय और साहित्यिक परिचय लिखे
  - (. महाकवि तुलसीदास द्वारा रचित "रामचरितमानस" के बारे में आप क्या जानते हैं, संक्षेप में बताएं ?
  - (. तुलसीदास द्वारा रचित रचनाओं के नाम लिखें |
  - (. वर्तमान समय में कोरोना की भयावह स्थिति पर एक अनुच्छेद लिखें
  - (. अपने प्रिय शिक्षक के नाम एक पत्र लिखें।
  - (. विद्यालय के हिंदी पखवाड़ा कार्यक्रम का एक आकर्षक विज्ञापन तैयार करें।

**SANSKRIT**

1. Write the shabdaroopani of 'कवि' 'गुरु' 'मति' 'नदी' 'राजन्' 'विद्वस्' 'अस्मद्' and 'युष्मद्' . Also write 'तत्' and 'किम्' shabda in all three gender types.
2. Write the word forms of 'कृ' and 'लभ्' dhaatu in 5 tenses. (लट् लृट् लङ् लोट् and विधिलिङ्लकार)
3. Learn all the word-forms by-heart.

**SCIENCE**

1. Learn all intext and out text question answers of chapter number 1, 6 and 10 and complete written work also in your notebook.
2. Write practical no 1 ,2,3,6,7,10,11 in your practical record book.
3. Draw fig. no. (6.1),(6.2),(6.5)(6.6),(6.8)(6.9),(6.10),(6.11)(6.13),(6.14)of Chapter 6 and Ray diagrams of chapter 10 in your holiday home work notebook.
4. Write answers of CCT questions in your Pisa notebook ( CCT questions are available in Google classroom).
5. Prepare a power point presentation on biodiversity of Karnataka/covid-19.

**SOCIAL STUDIES**

1. Make a collage displaying various incidents of Indian national movement and write 10 sentences about it.
2. List 5 ways in which humans affect the environment every day. Make a table where the first column is ACTIVITY, second column is HELPFUL or HARMFUL and the third columns 'HOW'? The activities could be hunting or use of water or anything you take from the environment or give to the environment-negative or positive.

ACTIVITY	HELPFUL/HARMFUL	HOW
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3. Make a list of states of India showing the following points. Capital city, Language spoken, dance forms, , religious places etc.

STATE	CAPITAL CITY	LANGUAGE SPOKEN	DANCE FORM	RELIGIOUS PLACE
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4. On outline of world map, colour and label the continents and oceans and also mark the following countries. India , Mexico, Zimbabwe, Canada, France Germany, Japan China, United Kingdom, United states of America, Italy

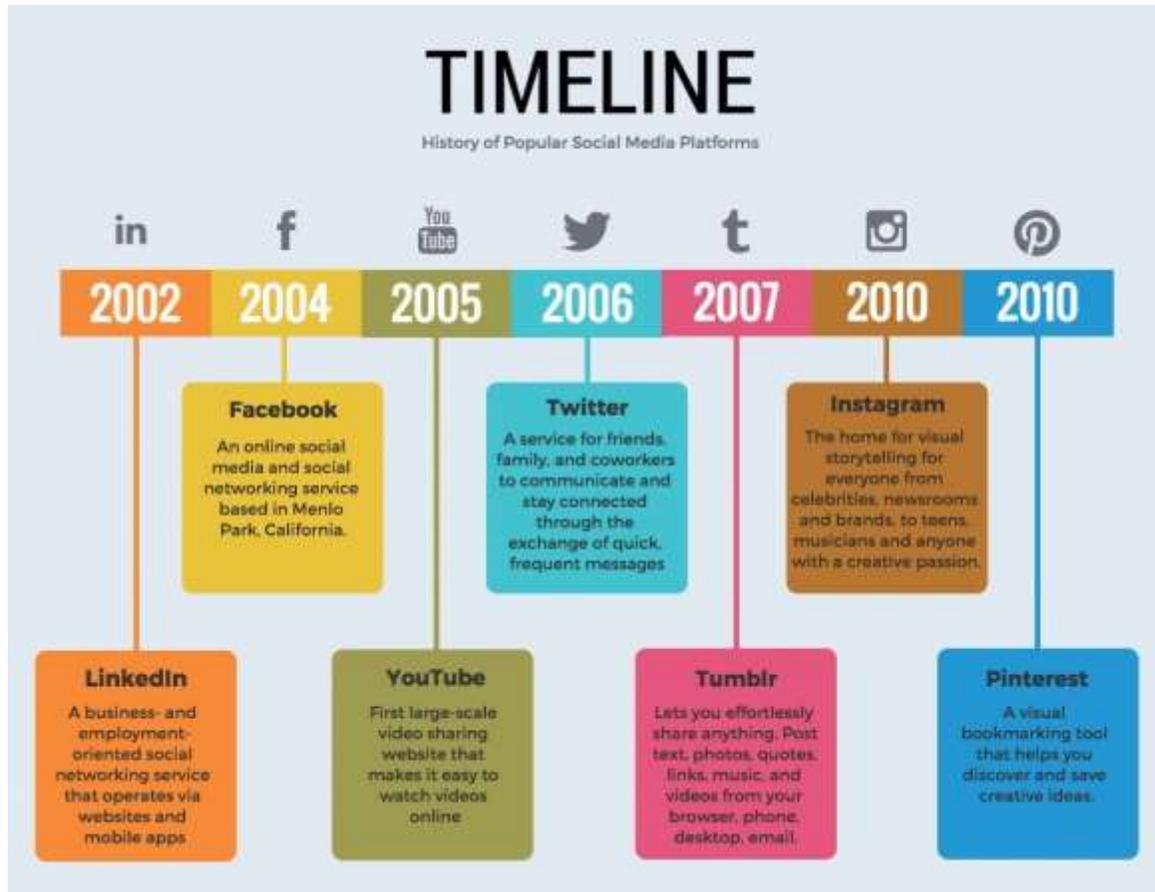
5. Define the following geographical terms in your C.W. notebook neatly.

PLATEAU, MARSH, MOUNTAIN RANGE, MOUTH, OASIS, SWAMP, ALTITUDE, FLOOD PLAIN, VALLEY, TUNDRA SEACOAST, TROPICS, PORT, CHANNEL TIDES, INLET, HARBOR, GLACIER, ICEBERG, OCEAN, SEA GULF, CHANNEL, BAY, LAKE, STRAIT, TRIBUTARY, RIVER BASIN, DELTA, DAM,

## Module 1

### Critical And Creative Thinking Sub: English

Here's a timeline sharing important information about various social media platforms. Let's have a look and answer the questions followed.



1. The time line depicts the \_\_\_\_\_
2. \_\_\_\_\_ the oldest social media platform whereas \_\_\_\_\_ and \_\_\_\_\_ form the most recent ones.
3. \_\_\_\_\_ is the most famous platform used by politicians, celebs, sportsmen, actors and artists to express their views.
4. The two most important things required to make account on above platforms are \_\_\_\_\_ and \_\_\_\_\_
5. Mention any two disadvantages of using these social networking sites.
6. The lens like symbol is an icon of \_\_\_\_\_ social networking site.

6. The speed of the internet is measured in \_\_\_\_\_.
7. The followers of a celebrity are increasing at the rate of 25% per week. The present no. of followers are 45000. What will be the total no. of followers after three weeks?

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8. In order to verify that you are not a robot, many websites provide a \_\_\_\_\_

(Captcha/ Finger Print Scanning/Color/Retina Scanning) code to fill in.

9. Mention any two situations when government of India debarred the internet services in certain states for a short period of time and give reason.

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**II. (A) You are Tabassum/Tarun, a resident of Satya Nagar Colony, Bhubaneswar, Orissa. You have noticed that some residents of your colony are repeatedly flouting quarantine rules laid out during the outbreak of the COVID-19 pandemic. Write a letter to the SHO of the local Police Station, drawing attention towards the same. Explain how such acts impact the health of the community and request immediate intervention and strict action.**

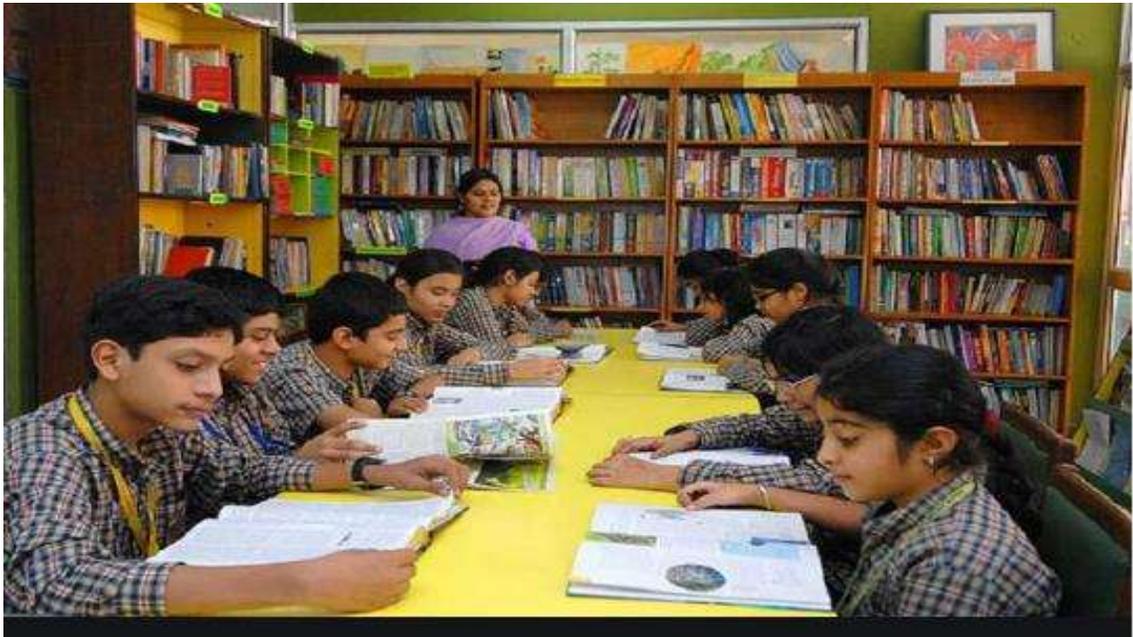
**III. Your cricket team won the District Cricket tournament in Mumbai . Write your feelings in your diary. (Diary entry )**

# MATHEMATICS

## REAL NUMBERS- CASE STUDY

### CASE STUDY 1.

To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section B of grade X. There are 32 students in section A and 36 students in section B.



1. What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B?
  - a) 144
  - b) 128
  - c) 288
  - d) 272
2. If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32 , 36) is
  - a) 2
  - b) 4
  - c) 6
  - d) 8

3. 36 can be expressed as a product of its primes as
- a)  $2^2 \times 3^2$
  - b)  $2^1 \times 3^3$
  - c)  $2^3 \times 3^1$
  - d)  $2^0 \times 3^0$
4.  $7 \times 11 \times 13 \times 15 + 15$  is a
- a) Prime number
  - b) Composite number
  - c) Neither prime nor composite
  - d) None of the above
5. If  $p$  and  $q$  are positive integers such that  $p = ab^2$  and  $q = a^2b$ , where  $a, b$  are prime numbers, then the LCM ( $p, q$ ) is
- a)  $ab$
  - b)  $a^2b^2$
  - c)  $a^3b^2$
  - d)  $a^3b^3$

### ANSWERS

- 1. c) 288
- 2. b) 4
- 3. a)  $2^2 \times 3^2$
- 4. b) composite number
- 5. b)  $a^2b^2$

### CASE STUDY 2:

A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.



1. In each room the same number of participants are to be seated and all of them being in the same subject, hence maximum number participants that can accommodated in each room are
  - a) 14
  - b) 12
  - c) 16
  - d) 18
2. What is the minimum number of rooms required during the event?
  - a) 11
  - b) 31
  - c) 41
  - d) 21
3. The LCM of 60, 84 and 108 is
  - a) 3780
  - b) 3680
  - c) 4780
  - d) 4680
4. The product of HCF and LCM of 60,84 and 108 is
  - a) 55360
  - b) 35360
  - c) 45500
  - d) 45360
5. 108 can be expressed as a product of its primes as
  - a)  $2^3 \times 3^2$
  - b)  $2^3 \times 3^3$
  - c)  $2^2 \times 3^2$
  - d)  $2^2 \times 3^3$

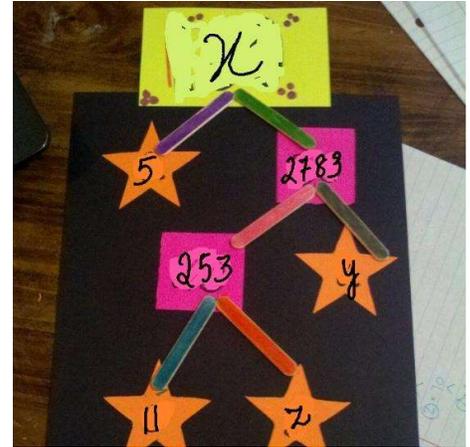
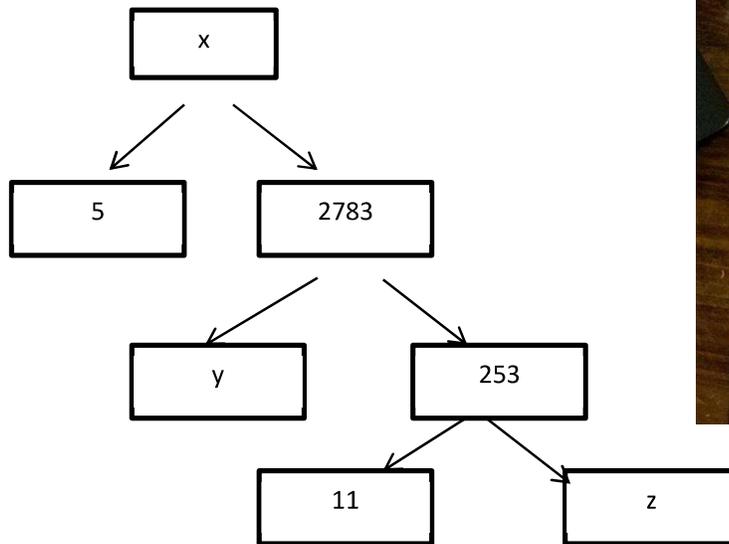
**ANSWERS**

1. b) 12
2. d) 21
3. a) 3780
4. d) 45360
5. d)  $2^2 \times 3^3$

### CASE STUDY 3:

A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:



1. What will be the value of  $x$ ?
  - a) 15005
  - b) 13915
  - c) 56920
  - d) 17429
2. What will be the value of  $y$ ?
  - a) 23
  - b) 22
  - c) 11
  - d) 19
3. What will be the value of  $z$ ?
  - a) 22
  - b) 23
  - c) 17
  - d) 19

4. According to Fundamental Theorem of Arithmetic 13915 is a
- a) Composite number
  - b) Prime number
  - c) Neither prime nor composite
  - d) Even number
5. The prime factorisation of 13915 is
- a)  $5 \times 11^3 \times 13^2$
  - b)  $5 \times 11^3 \times 23^2$
  - c)  $5 \times 11^2 \times 23$
  - d)  $5 \times 11^2 \times 13^2$

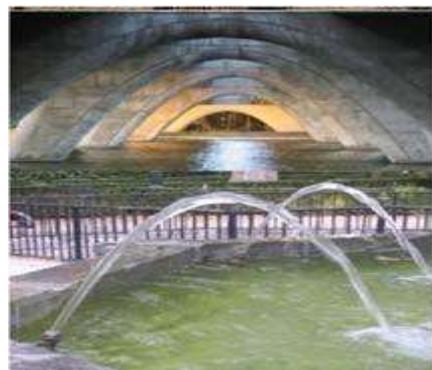
### **ANSWERS**

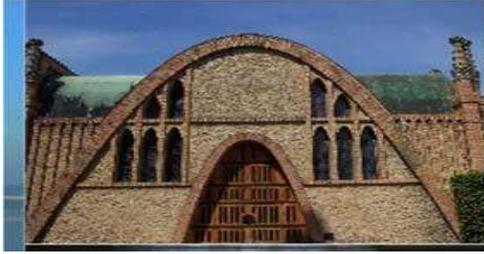
- 1. b) 13915
- 2. c) 11
- 3. b) 23
- 4. a) composite number
- 5. c)  $5 \times 11^2 \times 23$

### **POLYNOMIALS- CASE STUDY**

#### **CASE STUDY 1:**

The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.





1. In the standard form of quadratic polynomial,  $ax^2 + bx + c$ ,  $a$ ,  $b$  and  $c$  are
  - a) All are real numbers.
  - b) All are rational numbers.
  - c) 'a' is a non zero real number and  $b$  and  $c$  are any real numbers.
  - d) All are integers.
2. If the roots of the quadratic polynomial are equal, where the discriminant  $D = b^2 - 4ac$ , then
  - a)  $D > 0$
  - b)  $D < 0$
  - c)  $D \geq 0$
  - d)  $D = 0$
3. If  $\alpha$  and  $\frac{1}{\alpha}$  are the zeroes of the quadratic polynomial  $2x^2 - x + 8k$ , then  $k$  is
  - a) 4
  - b)  $\frac{1}{4}$
  - c)  $\frac{-1}{4}$
  - d) 2
4. The graph of  $x^2+1=0$ 
  - a) Intersects x-axis at two distinct points.
  - b) Touches x-axis at a point.
  - c) Neither touches nor intersects x-axis.
  - d) Either touches or intersects x-axis.
5. If the sum of the roots is  $-p$  and product of the roots is  $-\frac{1}{p}$ , then the quadratic polynomial is
  - a)  $k(-px^2 + \frac{x}{p} + 1)$

b)  $k \left( px^2 - \frac{x}{p} - 1 \right)$

c)  $k \left( x^2 + px - \frac{1}{p} \right)$

d)  $k \left( x^2 - px + \frac{1}{p} \right)$

### ANSWERS

1. c) 'a' is a non zero real number and b and c are any real numbers.

2. d)  $D=0$

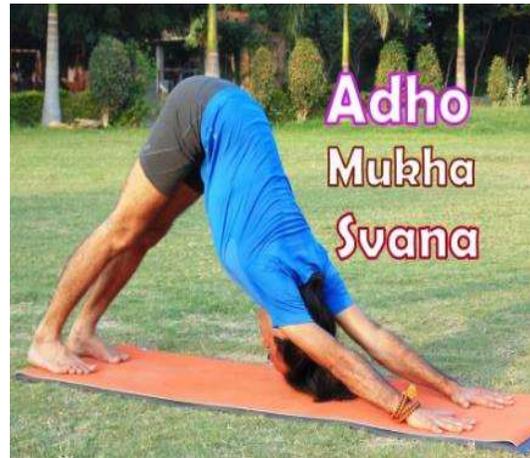
3. b)  $\frac{1}{4}$

4. c) Neither touches nor intersects x-axis.

5. c)  $k \left( x^2 + px - \frac{1}{p} \right)$

### CASE STUDY 2:

An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.



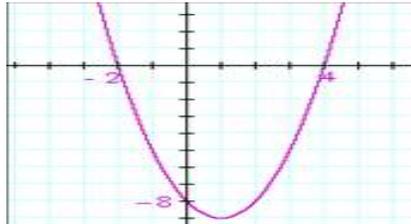
1. The shape of the poses shown is

- a) Spiral
- b) Ellipse
- c) Linear
- d) Parabola

2. The graph of parabola opens downwards, if \_\_\_\_\_

- a)  $a \geq 0$
- b)  $a = 0$
- c)  $a < 0$
- d)  $a > 0$

3. In the graph, how many zeroes are there for the polynomial?



- a) 0
- b) 1
- c) 2
- d) 3

4. The two zeroes in the above shown graph are

- a) 2, 4
- b) -2, 4
- c) -8, 4
- d) 2, -8

5. The zeroes of the quadratic polynomial  $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$  are

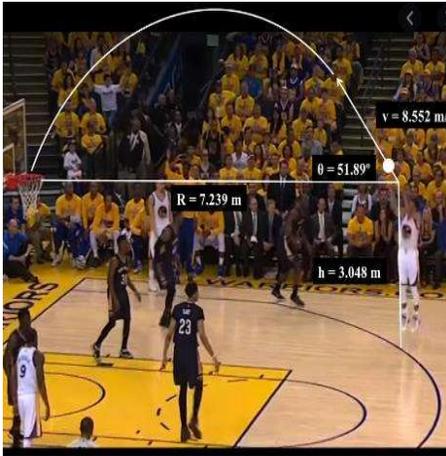
- a)  $\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$
- b)  $-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$
- c)  $\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$
- d)  $-\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$

### ANSWERS

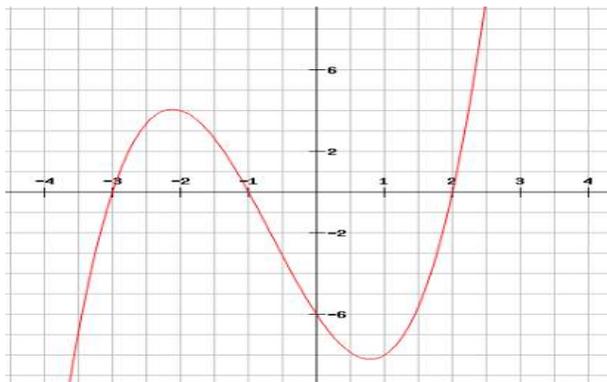
- 1. Parabola
- 2. c)  $a < 0$
- 3. c) 2
- 4. b) -2, 4
- 5. b)  $-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

### **CASE STUDY 3:**

Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.



1. The shape of the path traced shown is
  - a) Spiral
  - b) Ellipse
  - c) Linear
  - d) Parabola
2. The graph of parabola opens upwards, if \_\_\_\_\_
  - a)  $a = 0$
  - b)  $a < 0$
  - c)  $a > 0$
  - d)  $a \geq 0$
3. Observe the following graph and answer



In the above graph, how many zeroes are there for the polynomial?

- a) 0
  - b) 1
  - c) 2
  - d) 3
4. The three zeroes in the above shown graph are
- b) 2, 3,-1
  - c) -2, 3, 1
  - d) -3, -1, 2
  - e) -2, -3, -1
5. What will be the expression of the polynomial?
- a)  $x^3 + 2x^2 - 5x - 6$
  - b)  $x^3 + 2x^2 - 5x + 6$
  - c)  $x^3 + 2x^2 + 5x - 6$
  - d)  $x^3 + 2x^2 + 5x + 6$

### **ANSWERS**

- 1. d) parabola
- 2. c)  $a > 0$
- 3. d) 3
- 4. c) -3, -1, 2
- 5. a)  $x^3 + 2x^2 - 5x - 6$