

**A PROJECT REPORT
ON
THE KANAI BARASI BUWA SITE**



**A Project Submitted For
B.A 6th Sem. 2020**

Paper No. 6.6

**Under the esteemed Guidance of
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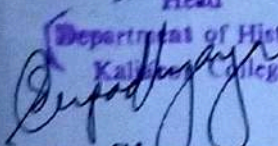
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Certificate

This is to certify this project entitled
The Kanai Barazi Buwa Site
_____ is a

bonafied work of Ishtiam Sheikh

Roll No: UA1713000054 of G.U. Registration
No 17069000 for the paper no. 6.6 of 6 Semester B.A.
course under Gauhati University.

Head
Department of History
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Counter Signature of HOD


Signature of Supervisor



Acknowledgement

I would like to express my special thanks of gratitude to my History teacher Dr. Bernali Kakati ma'am for their able guidance and support in completing my Project.

I would also like to extend my gratitude to the Principal of Kaliabor college, Dr. Hiranya Chaliha sir and Vice Principal Dr. Runima Sarmak ma'am as well as to the Head of the Hist. Dept. Dr. Sharda Upadhaya ma'am for providing me with all the facility that was required.

I'm really thankful to them who gave me the golden opportunity to do this wonderful project on the topic "The Kanai Barasi Rock Inscriptions", which also helped me in doing a lot of research and I came to know about so many new things.

DATE :- 24/8/23

Istisam Sheikh
6th Semester
(History Major)

INTRODUCTION

• Importance of Epigraphy

The Epigraphic evidences, which to a large extent are found accurate and reliable. Inscriptions of Assam, are generally found engraved and not written. They are engraved on metal plates, usually copper, on stone, tablets, on rock, pillars and outer parts of caves, temples and other buildings etc. They are so numerous that volumes can be written on them.

The subjects dealt with by the Epigraphs are varied. They give us a valuable insight into the political and cultural history of period. Many of them are Brahmatara, Dharmatara or Nankar / land grants or Renewal of such grants.

Sanskrit was the usual language in the Inscriptions. Though, later on, almost all land grants were written in Assamese.

Inscriptions help us not only in determining the chronology of the concerned King, donors, but also record their gifts of land, their accomplishments and achievements and their relation with contemporary powers. Most of the prasastis are considered as works of high literary merit.

"The Kanai Barasi Rock Inscriptions" site is located on the Northern bank of the river Brahmaputra, near Guwahati, Assam.

It has high historical value because it gives a significant evidence of a historical event and the year depicted on the inscription, 1206 C.E divides the History of Assam into the Ancient and Medieval periods on the basis of this inscription.

The Objectives of the Project

1. To study the Kanai Borosi Buwa site from historical perspective.
2. To Examine the historical importance of the Rock Engravings found in the site.
3. To document the Engravings which are otherwise under threat of extinction due to anthropogenic causes.

The Methodology used for this Project are:

1. Field Study of the historical site of Kanai Basasi Buwa located in North Guwahati, Assam.
2. Collection and Analysis of the Primary and Secondary sources for the study.

FACTUAL ANALYSIS

The 'Kanai Barasi' Rock Inscription site is located on the Northern bank of the river Brahmaputra lying by the side of a motorable road at a distance of about twenty five kilometers from the campus of Guwahati University.

The site lies on a low hillock on the bank of the river Brahmaputra with scattered pieces of boulders and a large block of rock surrounded by other smaller blocks.

This area appears to be of significant strategic importance as is revealed by three important rock inscriptions - all relating to military victories of regional powers over foreign invaders that attacked Assam

from the west.

While Rock Inscription [No. 1] belongs to 1206 CE, Rock Inscriptions No. 2 and No 3 were issued in 1665 CE and 1667 respectively.

- Rock Inscription 1 : This inscription records the destruction of the Turks who invaded Kamrupa in 1206 AD.

Muhammad - Ibn - Bakhtiyar Khilji an intrepid and bold Turko-Afghan leader after conquering Bihar and Bengal invaded Assam with an Army of 12,000 horsemen in 1206.

In Bihar he had destroyed the world famous Nalanda University and burnt its library.

King Prithu of Kamrupa decided to lay an ambush near this site. The central arch of the stone bridge on Basinadi was destroyed.

All boats were removed. Prithu struck when the Turkish Afghan army was trying to cross the river. The invading army was decimated. Most of its soldiers and horses were drowned in the River.

Bakhtiyar Khilji with a handful of horsemen escaped but was killed soon after.

This Account is given in Tabagat-i-Nasiri by a contemporary chronicler Minhaji - Uddin Abu-Umar - i - Usman.

- Rock Inscription No. 1 : In Sanskrit states, "Sake Turagayugmese Madhume Trayodase Kamarupam Samagatya Turaskah Khayanamayuh" (On the thirteenth day of Chaitra in the Saka era 1127 (1206 AD) the Turks coming into Kamarup were destroyed). It records destruction of the Turks who invaded Kamarupa

in 1127 Saka (1206 A.D).

• Rock Inscription 2 :- This inscription records that the Ministers Burah Gohain, Borphukan, Borohat Gohain Phukan and Dihingiya Sandi Kai Phukan of Swarganarayan Deo (Chakra Dhvaj Singha) caused the erection of a Rampart here in 1665 A.D after having defeated and slain Syed Sana and Syed Firoz.

• Rock Inscription 3 :- This inscription records that the Ministers Burah Gohain, Borphukan, Borohat Gohain Phukan and Dihingiya Sandi Kai Phukan of Swarganarayan Deo (Chakra Dhvaj Singha) caused the erection of a Rampart here in 1667 A.D.

The total number of rock blocks with petroglyphic engravings recorded at the site are six. The largest of the block has a girth of 37.8 feet and the smallest one measures 4.5 feet in length and 1.3 meters in breadth.

The Petroglyphic engravings consist of labyrinth, chessboard, circle, animal like figure, man riding animal, circle in a square, linear markings, circle, demon, lady indeterminate objects etc.

Fine grained granite are found to be protruded out of the alluvial soil cover in the area. These fine grained granite had been used for engraving rock arts and inscriptions.

In the vicinity on the bed of the river Brahmaputra, many similar granite bodies are found to be exposed.

Ancient ruins of a temple of Pre-Ahom period are found on scattered around on the river bed.

The site is protected by the Assam State department of Archaeology and basically known for the four plates of medieval stone inscriptions.

The inscriptions, drawings and other rock arts indicate a multi layered and discontinuous history.

A temple has been constructed very recently over a rock cut engraving of Ganesha and worshiped mainly by the local Assamese caste groups inhabiting the area nearby.

Another rock cut engraving of female has been considered by the local population as a female goddess and beginning to be worshiped.

Further down the site on the bank of the river Brahmaputra few blocks of stone are scattered over an area which show some ancient activity of a riverine population.

The Kanai Barasi Bowa is an archaeological site protected by the Directorate of Archaeology, Govt of Assam.

The site is a rocky outcrop of granite boulders which contain rock cut images, inscriptions, engravings and ~~wedge~~ and mason marks.

-Another rock cut engraving of female has been considered by the local population as a female goddess and beginning to be worshiped.

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This site is a rocky outcrop of granite boulders which contain rock cut images, inscriptions, engravings and ~~wedge~~ and mason marks.

One of the four major rock inscriptions mentions the annihilation of the first Muhammadian incursion into the Guwahati area on Saka year of 1127 (1206 CE) by Kamarupa ruler.

The other two rock inscriptions indicate the victory of the Ahoms over the Muhammadans in 1667 CE.

Another Inscription records the victory of Bar Phukan over the invading forces in the same war.

Different engravings on the rocks include geometric designs, human figurines, deities, dot marks etc.

Four inscriptions were found in the Kanai Barashi bowa site.

Two Inscriptions were found on the same piece of rock at greater height.

The other two inscriptions were found over two different rocks of which one was observed at a lesser height near water body. Below the third inscription, one sign was found.

The measurements of the first and second inscriptions could not be taken because of the height at which both are located.

Therefore, approximate measurement have been given. One labyrinth was noticed by the side of the fourth

inscription and below the labyrinth four signs or symbols were seen which were not discernable.

One female figurine was seen engraved on a rock and by its side one sign was engraved.

On another flat rock one chess board, one square with a circle inside and one bow was perceived.

A total of sixteen dot marks were observed in the site on the rocks of varied shapes and sizes in linear pattern.

The site has three rock cut inscriptions²¹, a rock-cut

geometrical design and a rock-cut figure of Ganesha

The earliest of the three inscriptions records invasion of Kamrupa by the Turks in 1206 C.E.

The other two inscriptions datable to the 17th Century C.E. refers to the battle of the Assamese army with the mughals.

Of these records of the site, the first inscription i.e. Kanai Barosibowa Rock Inscription is engraved upon a rock situated at a lower level in the Eastern part of the site.

The other two are engraved upon a huge rock in the middle of the site.

The former record known as the Kanai Barosikowa Rock Inscription is engraved in the Assamese and Devnagari script and is considered to be the earliest specimen of an Assamese inscription.

Conclusion

The above description provides a detailed glimpse of the Kanai Barasi Rock Inscriptions of archaeological vestiges scattered in a small locality in the Northern part of Guwahati which was once an important region of the cultural landscape of the Pragjyotisha - Kamarupa Kingdom.

Among the notable archaeological sites in the Guwahati region, "the Kanai Barasi Rock Inscriptions" has high historical value because it gives a significant evidence of a historical event and also the year depicted on the inscription, 1206 A.D. divided the History of Assam into the Ancient and Medieval periods on the basis of this Inscriptions.

The images of the inscriptions not only has high historical value because it depicts the Assamese script in its historical development but also the images will be used to depict both its historical significance as well as evidence of the script.

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 - Published by
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 - First Published 1986
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Pictures of the Site



The Entrance Gate of "Kanai Barasi Rock Inscription"

Certificate

This is to certify that the project work
entitled "REAL LIFE APPLICATION
OF COORDINATE GEOMETRY" contains
the works carried independently by Sukanya
Bora under my supervision. No part of this
work used for any other purpose.

Arun

(Dr Arun Mahanta)

Date: 15/10/2020

Declaration

I hereby declare that the project work is done by me under the supervision of Dr. Arun Mahanta Head of the Mathematics Department, Kaliabor College.

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I thank all my classmates for their encouragement and help for completing my work successfully.

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Date: 24.9.2019

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Introduction

Coordinate geometry or Cartesian geometry, is the study of geometry using a coordinate system. This contrasts with synthetic geometry. Coordinate geometry is used to physics and engineering, and also in aviation, rocketry, space science, and space flight. It is the foundation of most modern field of geometry, including algebraic, differential, discrete and computational geometry.

Usually the cartesian coordinate system is applied to manipulate equations for planes, straight lines, and squares, often in two and sometimes three dimensions. Geometrically, one studies the Euclidean plane (two dimensions) and Euclidean space (three dimension).

History

The Greek mathematician Menaechmus solved problems and proved theorems by using a method that had a strong resemblance to the use of coordinates. Further Apollonius of Perga, in *On Determinant Section*; dealt with problems in a manner that may be called an analytic geometry of one dimension, with the question of finding points on a line that were in a ratio to the others. And later the 11th-century Persian mathematician Omar Khayyam saw a strong relationship between geometry and algebra.

In history there are many examples of real life uses of coordinate geometry. Some examples are mentioned below

Raymondville Parabolic Bridge is a historic lenticular truss bridge. Hyperboloid structures were built by Russian engineer Vladimir Shukhov (1853-1939). The world's first hyperboloid tower is located in Polibino, Dankovsky District, Leningrad Oblast, Russia.

Conic Section

In the Cartesian coordinate system, the graph of a quadratic equation in two variables is always a conic section - though it may be degenerate, and all conic sections arise in this way. The equation will be the form $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$ — ①

The three types of conic section are the hyperbola, the parabola, and the ellipse, the circle is a special case of the ellipse, though historically it was sometimes called a fourth type.

Here we will only discuss about hyperbola, parabola and ellipse

Assuming a conic is not degenerate, the following conditions hold true

1. If $B^2 - 4AC > 0$, the conic is a hyperbola
2. If $B^2 - 4AC < 0$, the conic is a circle or an ellipse.
3. If $B^2 - 4AC = 0$, the conic is a parabola.

Real Life Application of Hyperbola

Hyperbola: Hyperbola is a symmetric open curve formed by the intersection of a circular cone with a plane at a smaller angle with its axis than the side of the cone.

Equation of Hyperbola: Equation of hyperbola is

$$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1 \quad \text{and} \quad \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

Some Real Life Examples and Uses of Hyperbola are Mentioned below

1. Hyperboloid cooling towers have become the design standard for all natural-draft cooling towers because of their structural strength and minimum usage of material. The hyperboloid shape also aids in accelerating the upward convective air flow, improving cooling efficiency.
2. Satellites: Satellite systems make heavy use of hyperbolas and hyperbolic functions. When scientists

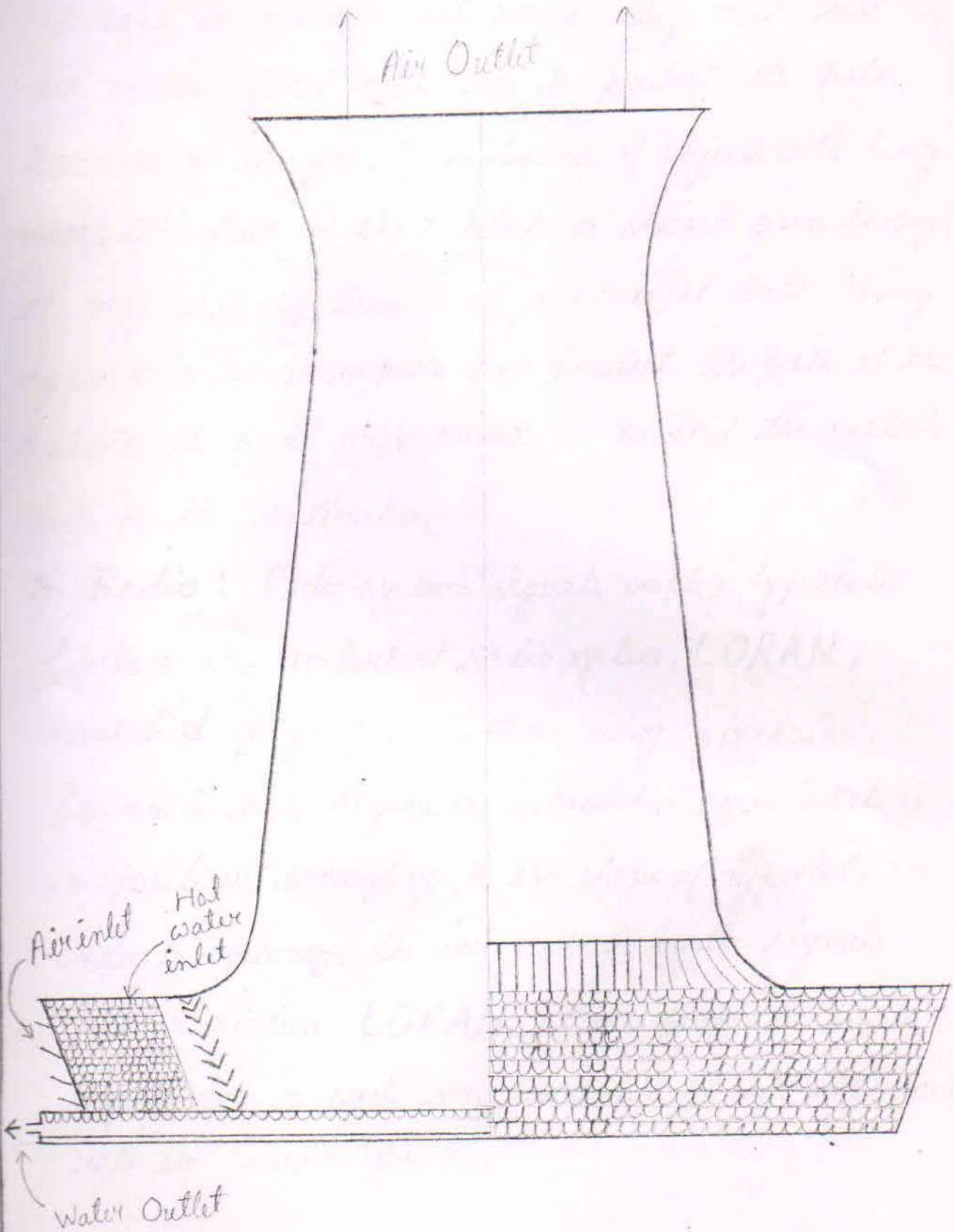
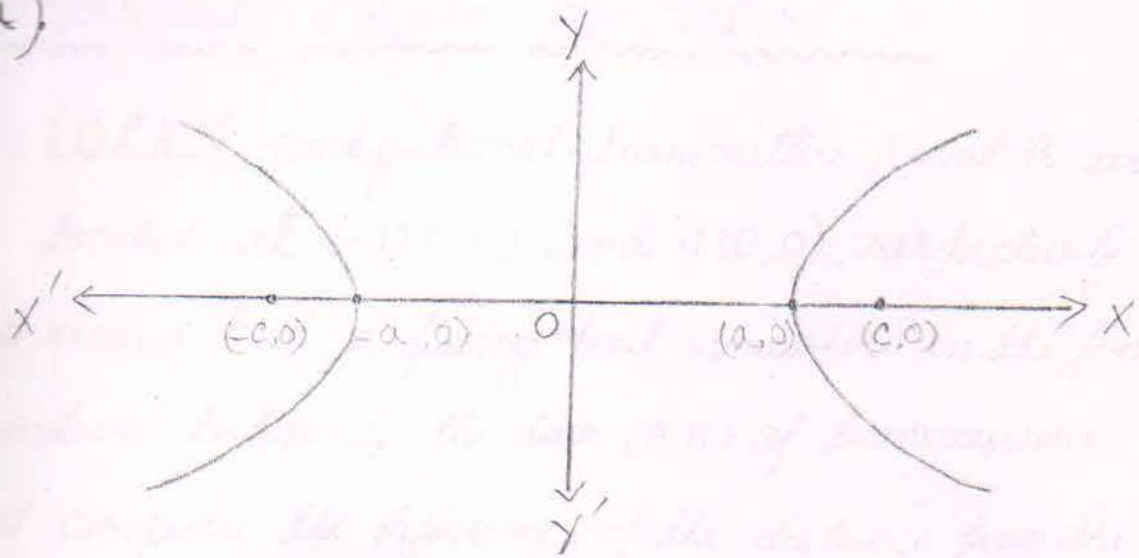


Fig: Natural Convection cooling tower

Launch a satellite into space, they must first use mathematical equations to predict its path. Because of the gravity influences of objects with heavy mass, the path of the satellite is skewed even though it may initially launch in a straight path. Using hyperbolas, astronomers can predict the path of the satellite to make adjustments so that the satellite gets to its destination.

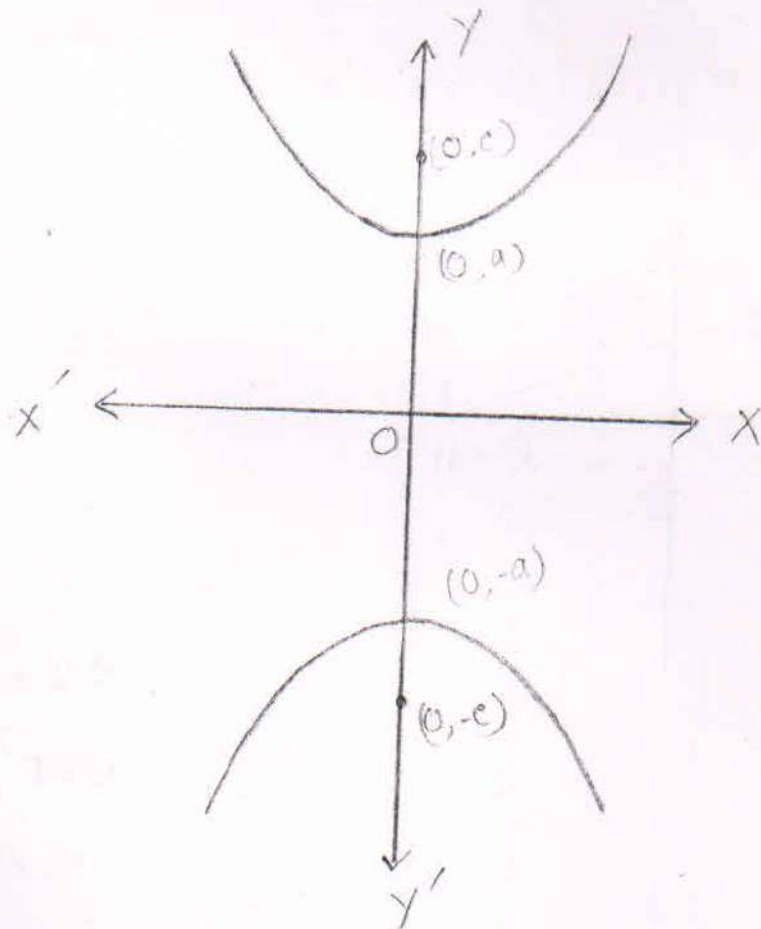
3. Radio: Radio systems' signals employ hyperbolic functions. One important radio system, **LORAN**, identified geographic positions using hyperbolas. Scientists and engineers established radio stations in positions according to the shape of hyperbolas in order to optimize the area covered by the signals from a station. **LORAN** allows people to locate objects over a wide area and played an important role in World War II.

a)



$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

b)

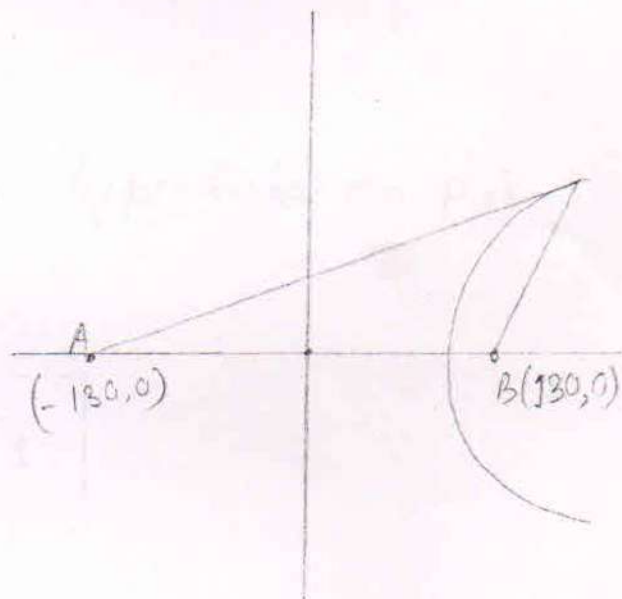


$$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$$

Real Life Problem of Hyperbola

Q. LORAN navigational transmitters A and B are located at $(-130, 0)$ and $(130, 0)$, respectively. A receiver 'P' on a fishing boat somewhere in the first quadrant listens to the pair (A, B) of transmissions and computes the difference of the distance from the boat to A and B as 240 miles. Find the equation of the hyperbola on which P is located.

Solⁿ



here

$$240 = 2a$$

$$\Rightarrow a = 120$$

$$c = 130$$

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

$$a^2 = (120)^2 = 14,400$$

$$c^2 = a^2 + b^2$$

$$\Rightarrow b^2 = c^2 - a^2$$

$$\Rightarrow 130^2 - 120^2 = b^2$$

$$\Rightarrow b^2 = 130^2 - 120^2$$

$$\Rightarrow b^2 = 2500$$

$$\Rightarrow b = 50$$

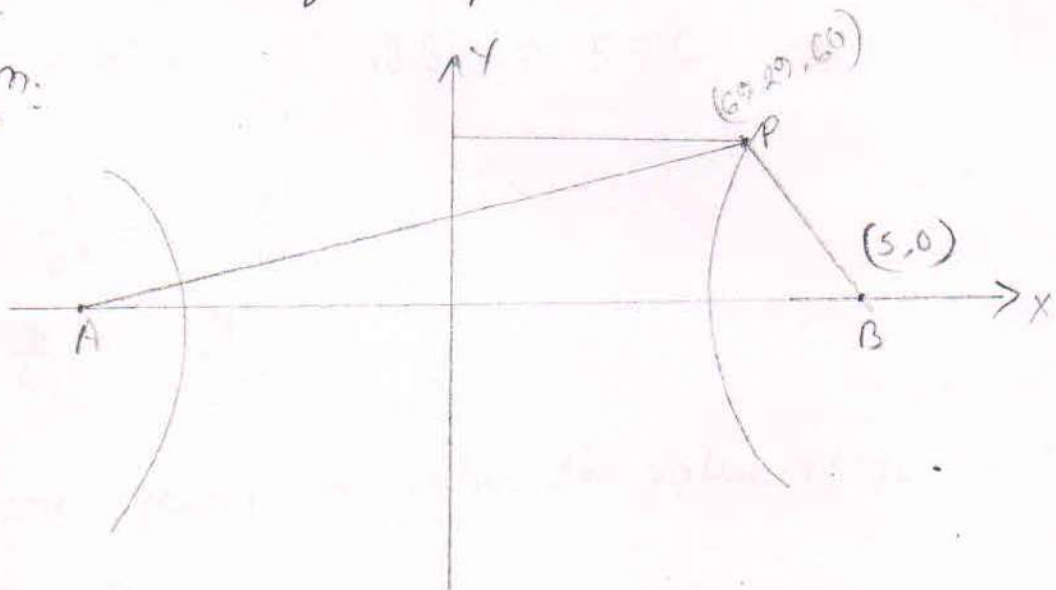
$$\therefore \frac{x^2}{14,400} - \frac{y^2}{2500} = 1$$

The equation of the hyperbola on P is located —

$$\boxed{\frac{x^2}{14,400} - \frac{y^2}{2500} = 1}$$

Q.2. Two radio stations are located 150 miles apart, where station A is west of station B. Radio signals are being transmitted simultaneously by both stations, travelling at a rate of 0.2 miles / μsec . A plane travelling at 60 miles above ground level has just passed by station B and is headed towards the other station. If the signal from B arrives at the plane 480 μsec before the signal sent from A. Determine the location of the plane.

Soln:



$$d = vt$$

$$= 0.2 \frac{\text{miles}}{\mu\text{sec}} \cdot 480 \mu\text{sec}$$

$$d = 96 \text{ miles}$$

$$PA - PB = 2a$$

$$\Rightarrow \frac{2a}{2} = \frac{96}{2}$$

$$\Rightarrow a = 48$$

$$c = 75$$

$$\therefore c^2 = a^2 + b^2$$

$$\Rightarrow 75^2 = 48^2 + b^2$$

$$\Rightarrow b^2 = 75^2 - 48^2$$

$$\Rightarrow b^2 = 3321 \approx 57.6$$

Now $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

$$\Rightarrow \frac{x^2}{48^2} - \frac{y^2}{3321} = 1$$

we are going to solve the value of x .
when $y = 60$

$$\frac{x^2}{48^2} - \frac{60^2}{3321} = 1$$

$$\Rightarrow \frac{x^2}{48^2} = 1 + \frac{60^2}{3321}$$

$$\Rightarrow x^2 = 48^2 \left(1 + \frac{60^2}{3321} \right)$$

$$\Rightarrow x^2 \approx 4801.56$$

$$\Rightarrow x \approx 69.29$$

The location of the pane is at

$$(69.29, 60)$$

Real Life Application of Ellipse

Ellipse: An ellipse is the set of all points in a plane, the sum of whose distances from two fixed points in the plane is a constant.

Equation of Ellipse: Equation of ellipse is

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \quad \text{and} \quad \frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$$

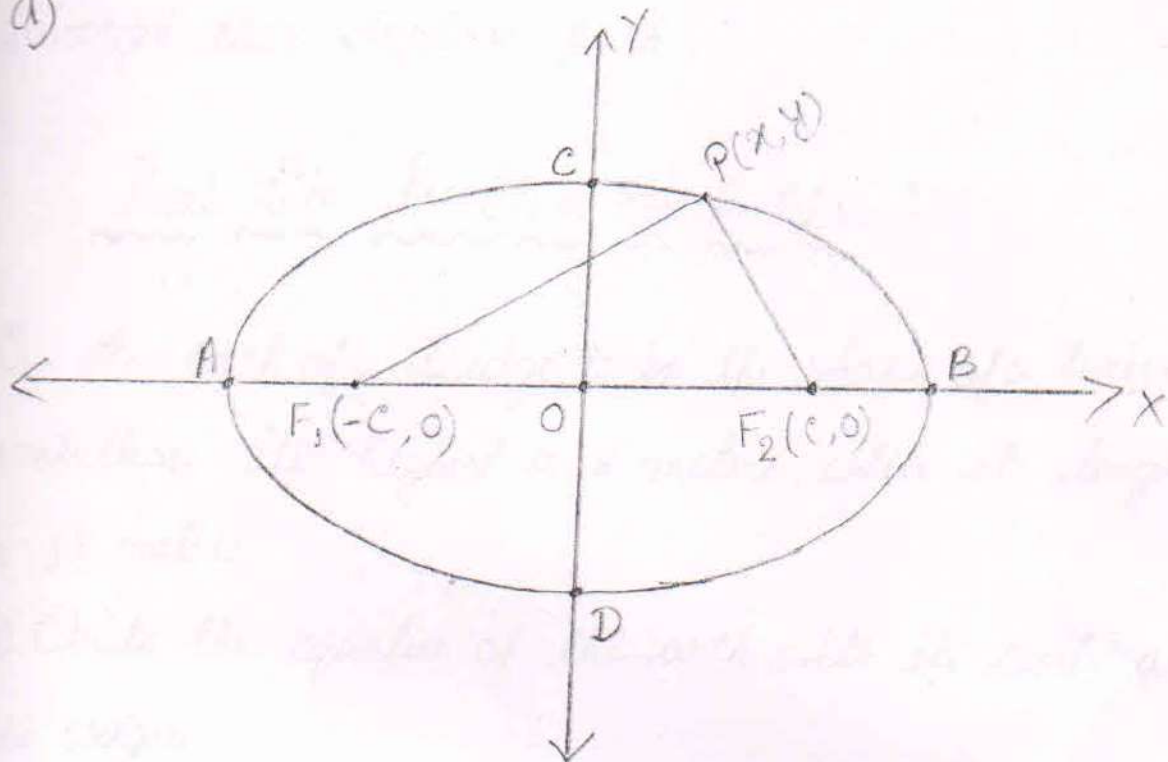
Some Real Life Examples and Uses of Ellipses are Mentioned below

1. Whispering Gallery: A focus is one of two points that defines the shape and size of the ellipse; they're located on the long axis of the ellipse, at equidistant points from the center of that axis. If light or a sound wave emanates from one focus of a real-life ellipse, it will be reflected to the other focus. This property is used to create whispering galleries, which are structures that allow someone who is whispering in one area to be heard clearly by someone in another area but not by anyone else. Famous examples of whispering galleries include the United States Statuary Capital Hall and London's St. Paul's Cathedral.

2. Lithotripsy Treatment: If you ever develop a kidney stone, you might discover the benefits of lithotripsy, a surgery-free method of destroying a kidney stone that uses the properties of the ellipse's two foci. For a lithotripsy treatment the patient lies in an elliptical tub, with the kidney stone aligned to one of the foci of the ellipse. Shockwaves emanating from the other focus concentrate on the kidney stone, reducing it to debris as small as sand that can pass through the body without discomfort. Because no incisions are made recovery from this treatment method is relatively quick and easy, and in some cases it can even be done as an outpatient procedure.

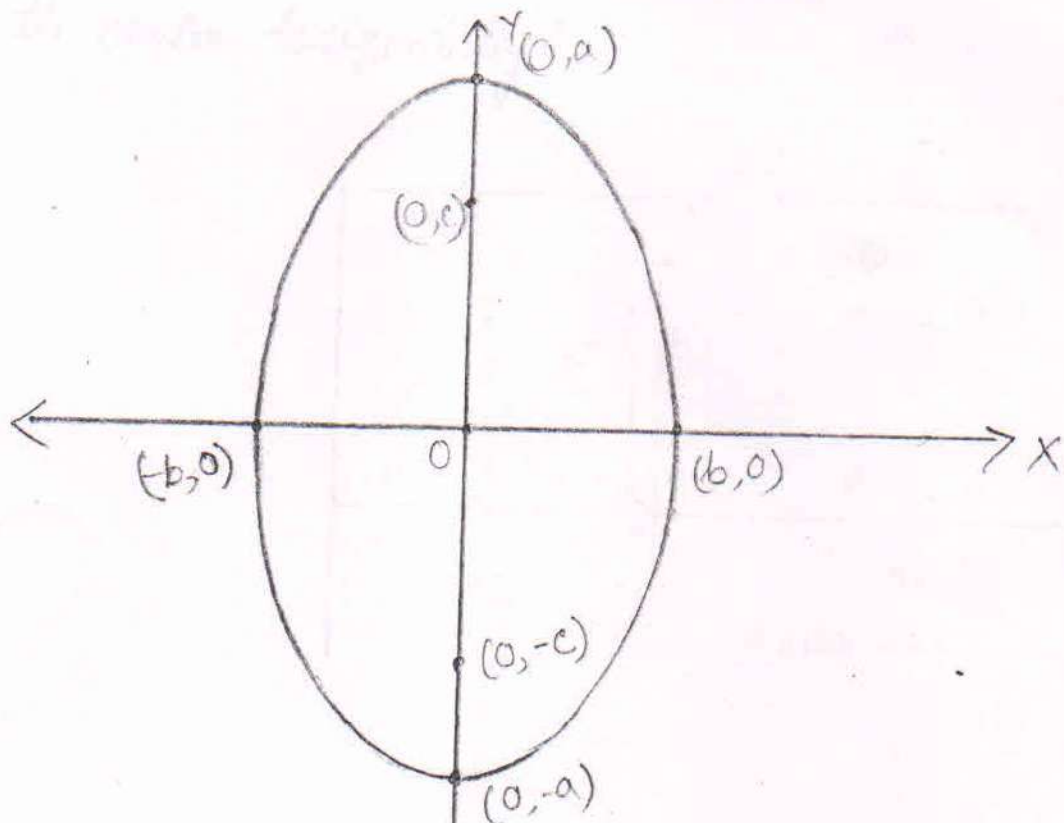
3. Elliptical Trainers: An elliptical training machine simulates the motion of running or walking, offering a low-impact cardio workout. When you walk or run in an elliptical trainer, your foot describes an elliptical path. An elliptical machine can be motor-driven or user-driven, and some elliptical trainers also feature handlebars that you can push or pull on to help move the foot pedals.

a)



$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

b)



$$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$$

through their elliptical path.

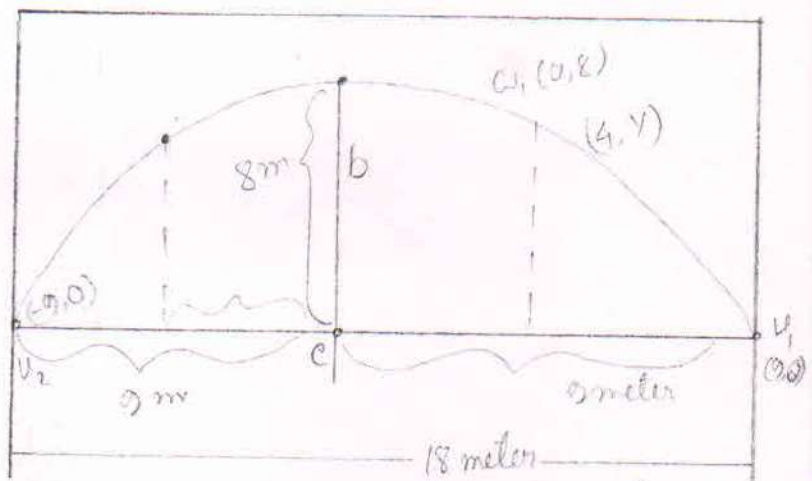
Real Life Problem of Ellipse :

Q. An arch of a bridge is in the shape of a horizontal semiellipse. Its highest is 8 meters, while its length is 18 meters.

(a) Write the equation of the arch with its center at the origin.

(b) How high is the arch at a point 4 meters away from the center horizontally?

Solⁿ



$$\text{Here } b = 8$$

$$a = 9$$

Major axis : x-axis

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

standard equation.

$$\textcircled{a} \quad \frac{x^2}{9^2} + \frac{y^2}{8^2} = 1$$

$$\Rightarrow \frac{x^2}{81} + \frac{y^2}{64} = 1$$

\textcircled{b} How high is the arch at a point 4 meters away from the center : (4, y)

$$\frac{x^2}{81} + \frac{y^2}{64} = 1$$

$$\Rightarrow \frac{4^2}{81} + \frac{y^2}{64} = 1$$

$$\Rightarrow \frac{16}{81} + \frac{y^2}{64} = 1$$

$$\Rightarrow \frac{y^2}{64} = 1 - \frac{16}{81}$$

$$\Rightarrow 64 \left(\frac{y^2}{64} \right) = \left(\frac{65}{81} \right) 64$$

$$\Rightarrow Y^2 = \frac{4160}{81}$$

$$\Rightarrow \sqrt{Y^2} = \sqrt{\frac{4160}{81}}$$

$$\Rightarrow Y = 7.17 \text{ m.}$$

\therefore the height is 7.17 meters



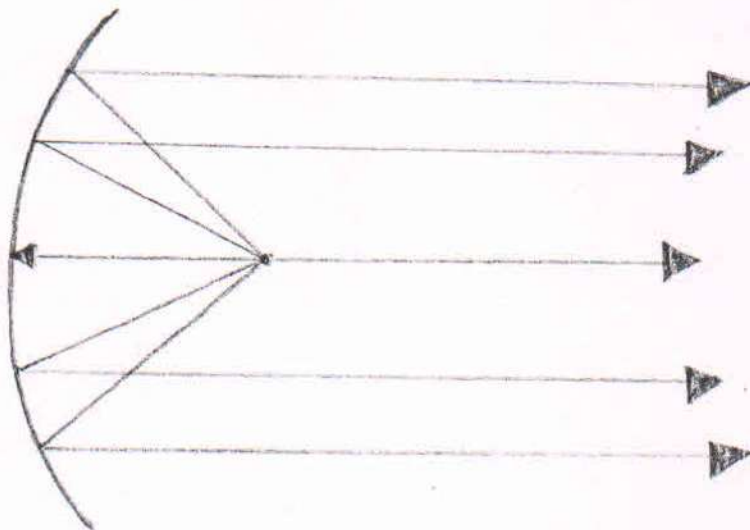
Real Life Application of Parabola.

Parabola: A parabola is the set of all points in a plane that are equidistant from a fixed line and a fixed point (not on the line) in the plane.

Equation of Parabola: Equation of parabola is $y^2 = 4ax$, $y^2 = -4ax$, $x^2 = 4ay$ and $x^2 = -4ay$

Some Real Life Examples and Uses of Parabola are mentioned below

1. Heater: Heaters are sold which make use of the reflection property of the parabola. The heat source is at the focus and heat is concentrated in parallel rays.

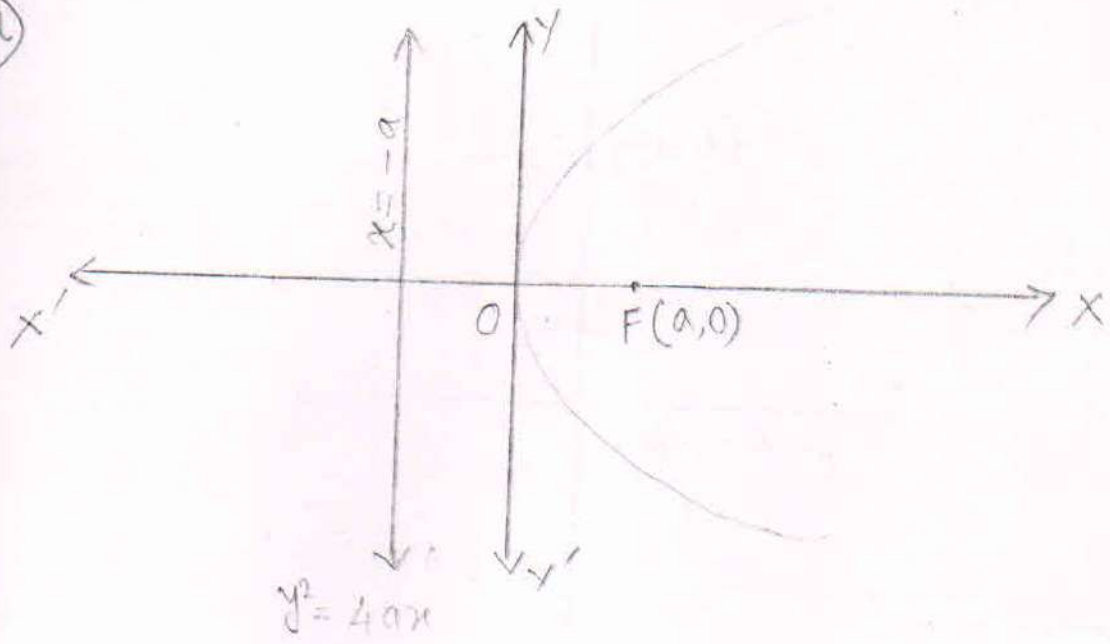


2. Satellite Dishes : Satellite Dishes work on this same principle. Incoming waves are concentrated to the focus.

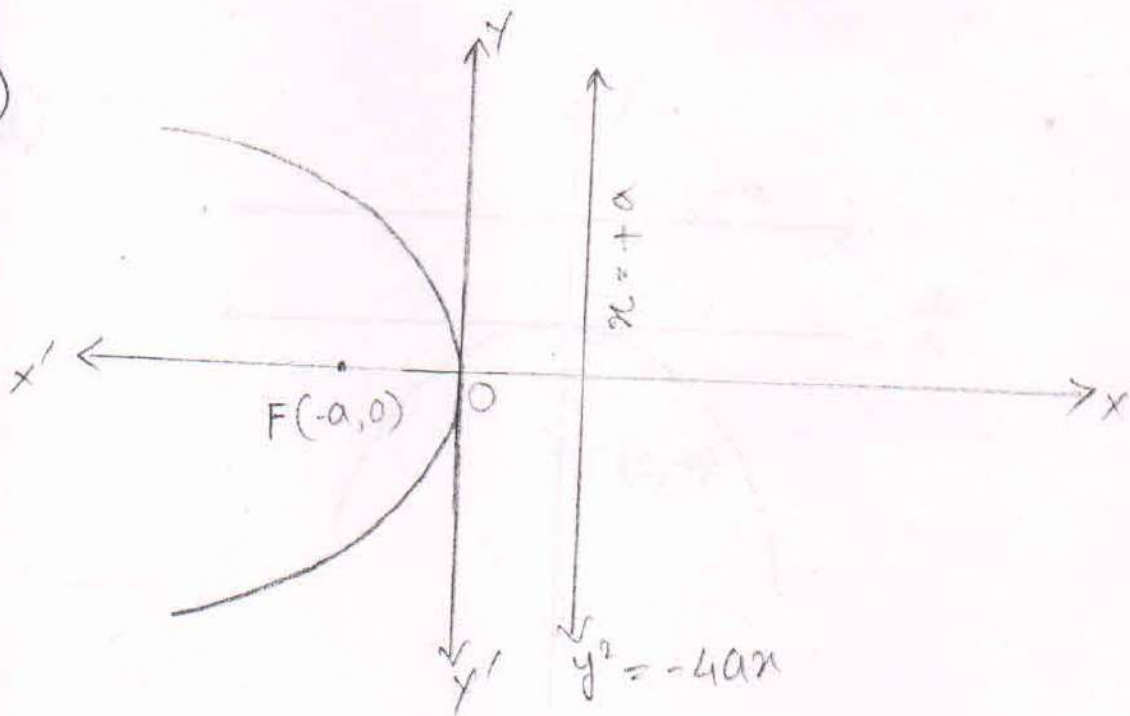
3. Parabolas in Architecture and Engineering :

Even architecture and engineering projects reveal the use of parabolas. Parabolic shapes can be seen in the Parabola, a structure in London built in 1962 that boasts a copper roof with parabolic and hyperbolic lines. The famous Golden Gate Bridge in San Francisco, California, has parabolas on each side of its side spans on towers.

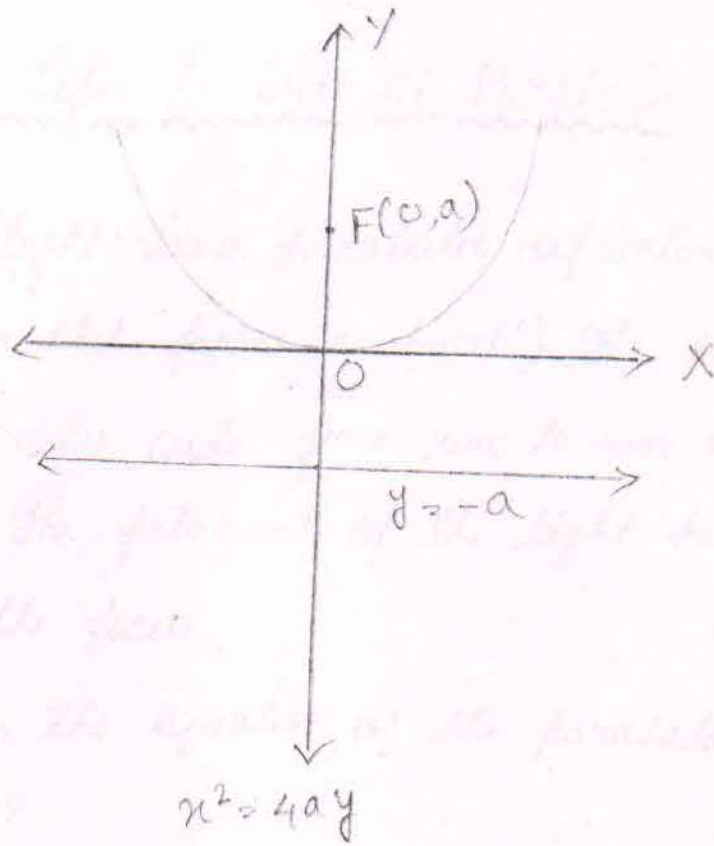
a)



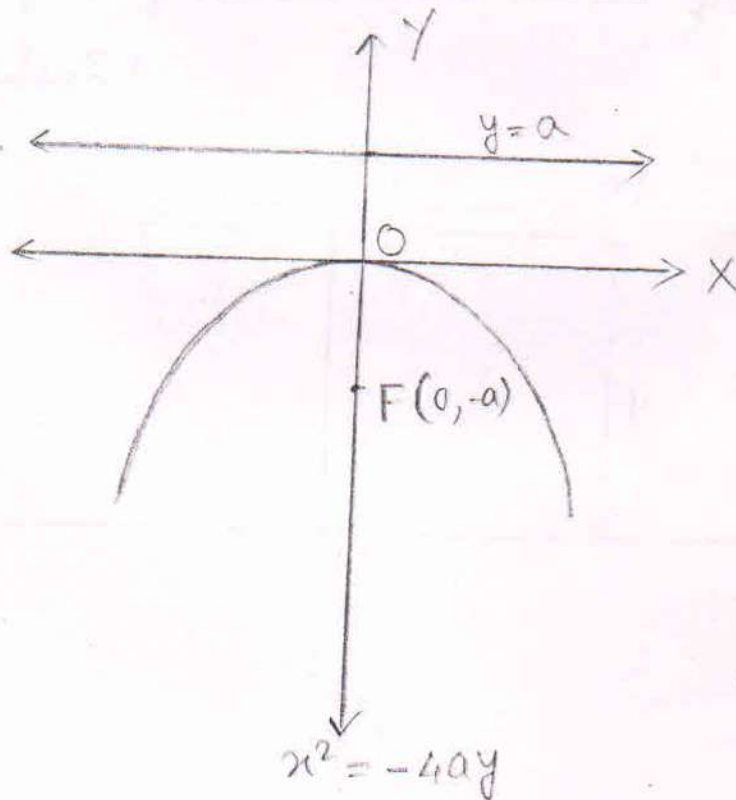
b)



c)



d)



here $x^2 = 4py$

$$\Rightarrow 8^2 = 4p(12)$$

$$\Rightarrow \frac{64}{48} = \frac{48p}{48}$$

$$\Rightarrow 1.33 = p$$

$$\therefore p = 1.33$$

(a) Now $x^2 = 5.32y$

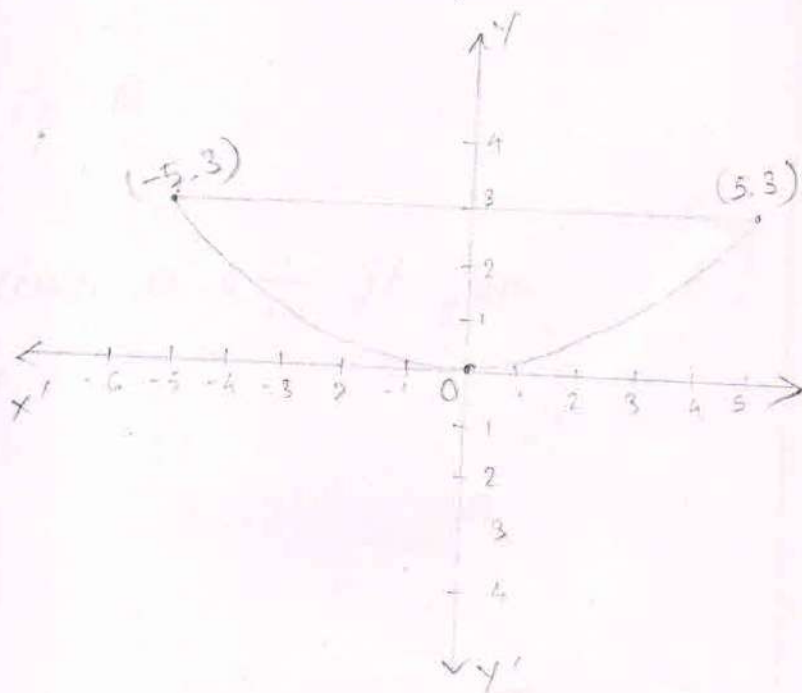
The equation of the parabola used for the reflector —

$$x^2 = 5.32y$$

(b) The distance between vertex and light bulb is 1.33 inches.

Q2. A satellite dish shaped like a paraboloid has its receiver located at the focus. How far is the receiver from the vertex if the dish is 10 ft across and 3 ft deep at the center?

Solⁿ



Parabola opens upward and vertex is at the origin

$$x^2 = 4Py \quad P = \text{focal distance}$$

which is the distance between
focus and the vertex

$$\begin{array}{l} x \quad y \\ (5, 3) \end{array}$$

$$5^2 = 4P(3)$$

$$\Rightarrow 25 = 12P$$

$$\Rightarrow \frac{25}{12} = \frac{12P}{12}$$

$$\Rightarrow P = \frac{25}{12}$$

$$\Rightarrow P = 2 \frac{1}{12} \text{ ft}$$

\therefore The receiver is $2 \frac{1}{12}$ ft from
the vertex

Conclusion :

From our study it has been found that there are widespread application of co-ordinate Geometry in real life in modern society. Science and technology have been able to explore a lot for the well being of mankind with the with the help of this important part of mathematics. Some of the examples of its uses are Satellite, Cooling Tower, Radio, Whispering gallery, Lithotripsy Treatment, Elliptical Trainers, Heater, Satellite Dishes. Architecture Engineering etc etc.

It is conclude that the application of co-ordinate geometry in Science and Technology shall have a greater impact in real life of the society in future.

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