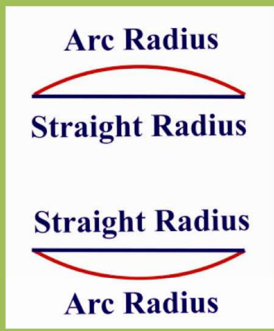
Include in Syllabus for Secondary, Higher Secondary, B.Sc - I, B.Sc - II, B.Sc - III, M.Sc - I, M.Sc - II and New Research (In English & Marathi), (Shantaram Janorkar Foundation of Mathematics)

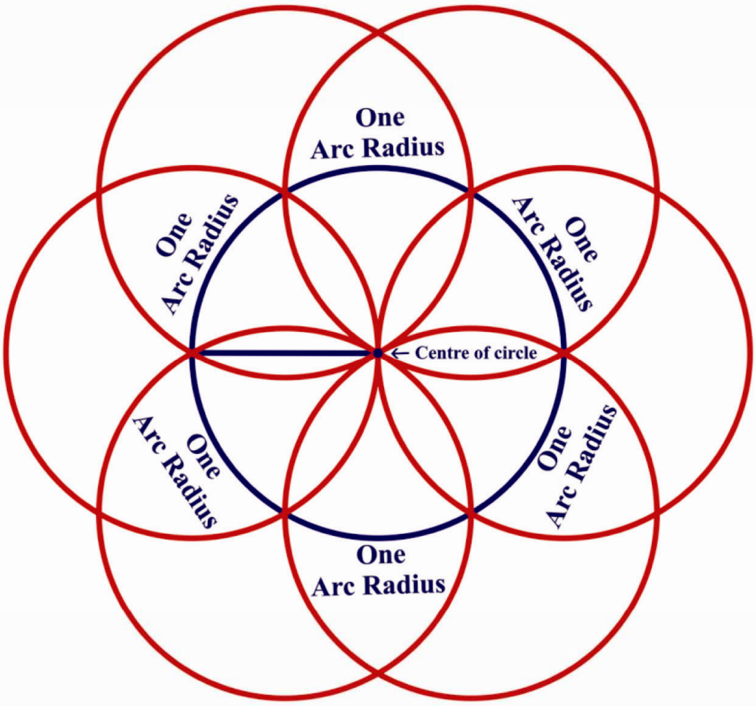
Arc Radius, Goba Verification and Its Applications

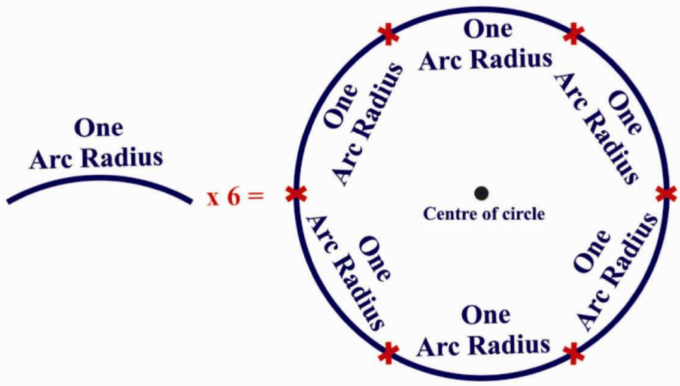
Formula of Arc Radius: $2\ominus r_s \div 6$ **OR** $d_s\ominus \div 6$

OR

r_s x 1.047197551 Su.S.J. Constant







Author & Researcher

Dhananjay S. Janorkar

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Mahan - 444 405, Tq.Barshitakli Dist. Akola, (Maharashtra State), INDIA

Late Mr. Shantaram Bapurao Janorkar & Mrs. Sulabha Shantaram Janorkar

GREETINGS

My father and researcher Late Mr. Shantaram Bapurao Janorkar (B.Sc. (Agri.) & G.Sc. (UNI)) and mother Mrs. Sulabha Shantaram Janorkar in memory of his unforgettable work was published and dedication to the World.

: Dhananjay Shantaram Janorkar
Author & Researcher

Arc Radius, Goba Verification and Its Applications

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Editorial

Dear Reader,

"Arc Radius, Goba Verification and Its Applications", This book has been launched in the memory of my father and researcher late Mr. Shantaram Bapurao Janorkar and mother Mrs Sulabha Shantaram Janorkar by me, published by Om Publications, Mahan, Tq. Barshitakli, Dist.Akola, (Maharashtra State), India and it is certified by **ISBN, QR Code, ISO 9001:2015.**

This book is in 'Print/CD-ROM/Online' formats. I have been trying to deliver this book to the scholars and scientists of 511 universities of India and to the scholars and scientists of 10,877 universities all over the world. I sincerely request to honorable scholars and scientists to continue further my present work. There is such a great extent of knowledge in this research work that the yet to be in completed research will be completed with this research and logic and the world will get to know the real and true knowledge and you can put new theorems before the world created through this research. To help this real and true knowledge put forward before the world is the very primary objective of my efforts. While thinking over this research paper prepared by me, I am getting new concepts through this research and that inspires me to do research and prepare research on different new subjects. It is said that time and tide waits for none; 'Death' is the eternal truth for all living beings on earth. Hence, it is utmost essential to put forth my research papers in front of the world. I feel, after my death, there will be nobody to put forth or present this research in front of the world.

ॐ Purnamadah: Purnamidam Purnat Purnamudachyate । Purnasya Purnamadaya Purna Mevavashisyate ॥

In geometry, symbol for measurement accepted by world scientists (world official) is degree and the very degree is the root, scale, source and base of the research. Degree: Closed chop (Compass), Tip of the compass means point, means 1 point, means 1^{o} degree, means dot • = degree means unit of measurement. The base of this whole research is 36^{o} measure of circle. This is a fundamental research, in mathematics (Geometry) is a new concept created. Which, I am putting in the form of book before the World.

By transforming this research which is originally in Marathi language, into scientific and mathematical language I am publishing this book. If you look at this research with the unselfish vision of a scholar, scientist (researcher) and if you carefully read the work published in this publication, you will easily understand the research work and ways for further research on this work can be found. In this research many new theorems have been established, different new methods have been found and in the same way many new theorems and methods will be found.

In case you find any difficulty in understanding the book please send your queries in writing on the editorial address, I shall sincerely strive to solve them. You can contact me round the clock on phone or in person.

The most important formulas in mathematics, geometry $2\ominus r_s \div 6$, $d_s\ominus \div 6$ and $r_s \times 1.047197551$ Su.S.J. Constant, these three arc radius formulas are given. These formulas can be used to provide the proofs of new theorems etc and to determine the answers and on the basis of the expression 'circumference of circle divided by diameter' (circumference of circle 6283185306^{o} ÷ straight diameter 2000000000^{o} = 3.141592653 constant of Goba), from the different formulae of equations in mathematics (geometry), put forward by me, we get definite, complete and rational answers. It has benefits in Secondary, Higher Secondary, B.Sc - I, II, III, M.Sc - I, II and New Research.

All the persons in the world can download free of charge this book from the website **'www.sbjanorkar.com, Dhananjay Janorkar - Academia.edu, Dhananjay Shantaram Janorkar - SSRN, Dhananjay Janorkar - ResearchGate and Dhananjay Janorkar - Google scholars'** I request sincerely all of you to help me to share this book to all and to take the newly created formulae in to the syllabus. I dedicate the first edition 2019 of this, *"Arc Radius, Goba Verification and Its Applications",* book to the memory of my father and the researcher of this basic work, late Mr.Shantaram Bapurao Janorkar, the valuable research done by him, and his trust in education.

✸ Dhananjay S. Janorkar

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Unit - I : Introduction, Definition with Example, Degree, Degree Radius, Straight Radius, Measure of straight radius, Arc Radius, Measure of arc radius, Radius of the circle, Measure of Radius, Diameter, Straight diameter, Arc diameter, System of homogeneous circle, System of anti-homogeneous circle, Measure of circumference, Circle, Measure of circle, Center of circle, Measure of centre, Circumference of circle, Measure of circumference of circle, Goba, Goba radian, The symbol of Goba, All circles are congruent, Both circles are congruent, Verification of arc radius is proportional to straight radius, circumference of circle is proportional to diameter, Length of a circumference of a circle, Circumference of circle in degrees, Circumference of circle in radians.

Unit - II : Length of a Circular Arc, Length of circular line of circumference of circle.

Unit - III : Arc radius from Straight radius, Straight radius from Arc radius, Straight radius of circumference of circle, Verification of arc radius is proportional to straight radius, circumference of circle is proportional to diameter.

Unit - IV : The formula of arc radius, *Verification of the new formula of Arc radius.*

Unit - V : Measure of circle, Measure of circumference of circle, The triangle is in 180º.

Unit - VI : Measure of circle, Measure of circumference of circle, Goba, Goba radian, *Arc Radius 6º according to measure of circle, Arc Radius 60º according to measure of circumference of circle,* Measure of centre of circle.

Unit - VII : Introduction, Goba, Circumference of circle, Area of circle, Area of Sector, Straight radius, Arc radius, Straight Diameter, Arc Diameter, Formula of the Volume of the sphere (cubic units), Formula of the Volume of the hemisphere (cubic units), Volume of Ellipsoid, Formula of the Cube of the Straight radius, Cylinder, Cone, Frustum of the cone, Length of the Arc, Area of shaded ring of a circle, Length of a Circular Arc, Area of Circle Sector.

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✸ The Original Research is in Marathi Language.

Chapter (Unit) … I

Arc Radius: Part - 1

INTRODUCTION: This is a fundamental research, in mathematics (Geometry) is a new concept created. Which, Dhananjay Shantaram Janorkar is putting in the form of book before the World. In the research paper titled *"The self - proving theorem of Goba and its explanation on the basis of a formula (Goba Cha Swayamshidha Sidhanta Wa Sutrachya Aadharache Spastikaran, (In marathi),"* Published in, International Journal of Shantaram Janorkar Foundation of Mathematics, Science & Spiritual, Edition–1, 15 September, 2015, Page No. 81-156, (In english), Aawaruti -1 (Edition-1), 15 September, 2015, Pan Number 157-226, (In marathi), ISO 9001:2008, ISSN (P):2454-5236, ISSN (O):2454-633X, ISBN: 978-81-930845-0-2, which is researched by Late Shri Shantaram Bapurao Janorkar and compiled by Dhananjay Shantaram Janorkar with providing diffetent examples and putting them in scientific and mathematical language, In those research paper, on the original circumference of circle of the first construction, there are six circumference of circles. Dhananjay Shantaram Janorkar has tried to explain clearly in scientific and mathematical language by giving different examples that these six circumferences of circles divide the original circumference of circle in six arc radii. With the help of this research paper, the new formula of arc radius has emerged which is *The Theorem of the Formula of Arc Radius* [Kans Trijechyaa Sutrachaa Siddhant (In Marathi)], International Journal of Shantaram Janorkar Foundation of Mathematics, Science & Spiritual, Edition–2, Volume - 2, Issue - 2, 15 September, 2016, Page No. 1-18, (In english), Aawaruti -2, (Edition-2), Volume - 2, Issue - 2, 15 September, 2016, Pan Number 19-36, (In marathi), ISO 9001:2008, ISSN (P):2454-5236, ISSN (O):2454-633X, ISBN: 978-81-930845-1-9, And author and researcher Dhananjay Shantaram Janorkar is putting these formulae before the world and he has tried to explain clearly this formula in scientific and mathematical language by giving different examples in this, *"Arc Radius, Goba Verification and Its Applications"*, book.

Moreover, to establish this research scientifically, renowned mathematician, Honorable Prof. Dr. T. M. Karade, (D.Sc., D.Sc.), Prof. Dr. Shriram B. Patil, Prof. Dr.B.S. Rajput, Prof. Dr. M. T. Teli, Prof. Dr. Kamel Lahmar (Algeria), AFRICA, Prof. Dr. Kishor S. Adhav, (D.Sc.), Prof. Dr.J.N. Salunke, Prof. Dr. S. D. Katore, Prof. Dr. M. B. Dhakne and Prof. Dr. D. T. Solanke gave the guidance to author and still they are doing so from time to time for which Dhananjay Shantaram Janorkar has greatful to them.

Dhananjay Shantaram Janorkar has tried to explain clearly how six arc radii are created from the original circumferences of circle in scientific and mathematical language by giving different examples.

As follows,

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653

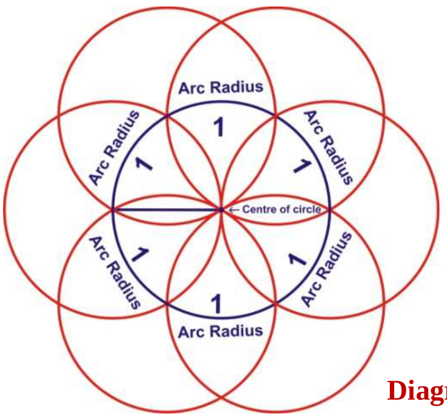


Diagram No.1

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

DEFINITIONS:

***1. Degree* = unit of Measurement**

Example 1.

Closed chop (Compass), Tip of the compass means point, means 1 point, means 1^0 degree, means dot • = degree means unit of measurement

Diagram No.3

Open the compass (Means chop) as follows, means which shows the nonsupernatural.

• ⟵ + ⟶ • as we open the compass the invisible degree is bisect in to two degree. (1^0) one degree becomes (2^0) two degree.

2. Degree Radius: When closed chop (Compass) is opened measure of one degree becomes measure of two degree. This distance between measures of two degree is called degree radius.

Example 2.

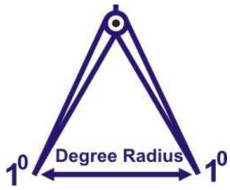


Diagram No.4

3. Straight Radius: Straight line segment joining centre of the circle and centre of the firstly constructed circle on the circumference of the original circle is called straight radius.

Example 3.

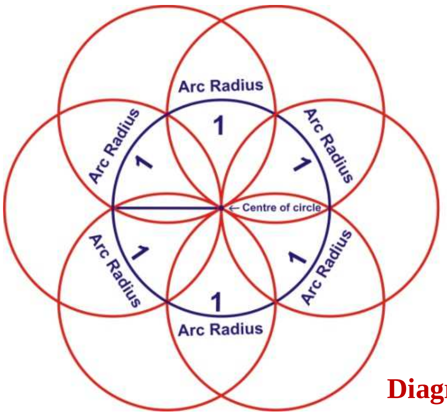


Diagram No.5

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.6

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

2 of 52

4. Measure of straight radius: Distance between two apex of the measure of straight radius is called "Measure of straight radius" and it is in four degree measure = 4^0

OR

Constant No.1: U.S.J. Constant = Measure of straight radius 1^0 become 2^0, 2^0 become 4^0

1^0 become 3^0, 3^0 become 6^0 Measure of arc radius

Measure of straight radius 4^0 And Measure of Arc radius 6^0

In constant No. 1. U.S.J. constant means Uday Shantaram Janorkar

Example 4.

Measure of straight radius =It is sum of the measure of straight radius in clockwise direction And anticlockwise direction

$= (1^0 + 1^0) = 2^0 + (1^0 + 1^0) = 2^0$

$= (2^0) + (2^0) = 4^0$ Measure of straight radius

Diagram No. 7

5. Arc Radius: An arcular line segment joining centre of the circle and centre of the firstly constructed circle on the circumference of the original circle is called arc radius.

OR

The segment of circumference of a circle means An (Arc) arcular line segment joining measure of centre of a circle and measure of centre on the circumference of a circle and the distance between the two measures of center are equal to straight radius, in clockwise and anti clockwise direction and which divide the circumference of the original circle in to six equal parts is called "Arc Radius" of circle.

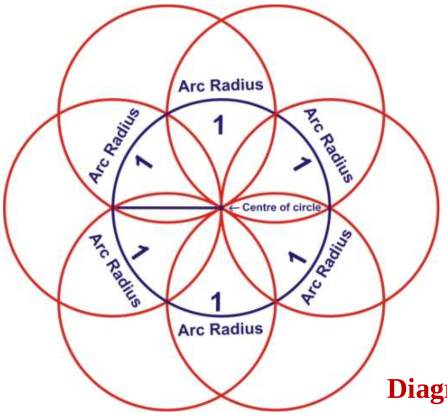
OR

Length of arc segment of circumference of circle is equal to radius then that segment of circumference of circle is called "Arc radius".

OR

The segment of the circumference of a circle whose length (distance) equal to straight radius its segment of the circumference of a circle is called "Arc Radius".

Example 5.



On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.9

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Diagram No.8

6. Measure of arc radius: Distance between two apex of the measure of arc radius is called “Measure of arc radius” and it is in six degree measure = 6^0

OR

<u>*Constant No.1:*</u> U.S.J. Constant = Measure of straight radius 1^0 become 2^0, 2^0 become 4^0

1^0 become 3^0, 3^0 become 6^0 Measure of arc radius

Measure of straight radius 4^0 And Measure of Arc radius 6^0

In constant No. 1. U.S.J. constant means Uday Shantaram Janorkar

Example 6.

Measure of arc radius = It is sum of the measure of arc radius in clockwise direction And anticlockwise direction

$= (1^0 + 1^0 + 1^0) = 3^0 + (1^0 + 1^0 + 1^0) = 3^0$

$= (3^0) + (3^0) = 6^0$ Measure of arc radius

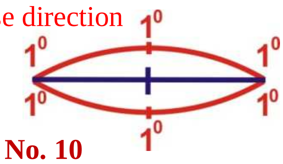


Diagram No. 10

OR

After opening the chop (compass), original 1^0; one degree becomes 2^0. As per the diagram they are created at equal distance $1^0 + 1^0 = 2^0$. If these degree are joined by a straight line, this straight line is called “Straight radius”.

After opening the chop (compass), original 1^0; one degree becomes 3^0. As per the diagram they are created at equal distance $1^0 + 1^0 + 1^0 = 3^0$. This circular circumference arc line is called “Arc radius”.

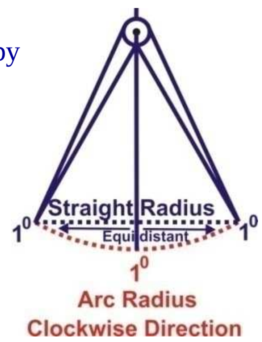


Diagram No.11

Here we have seen two types of radius. Straight radius whose measure is 2^0 and Arc radius whose measure is 3^0

After opening the chop (compass), original 1^0; one degree becomes 2^0. As per the diagram they are created at equal distance $1^0 + 1^0 = 2^0$. If these degree are joined by a straight line, this straight line is called “Straight radius”.

After opening the chop (compass), original 1^0; one degree becomes 3^0. As per the diagram they are created at equal distance $1^0 + 1^0 + 1^0 = 3^0$. This circular circumference arc line is called “Arc radius”.

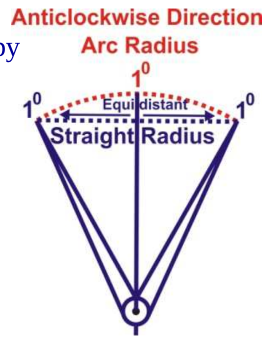


Diagram No.12

Here we have seen two types of radius. Straight radius whose measure is 2^0 and Arc radius whose measure is 3^0

7. Radius of the circle: A line segment (straight and arcual) joining centre of the circle and centre of the firstly constructed circle on the circumference of the original circle is called radius of the circle. The straight line segment is called straight radius and arcual line segment is called arc radius.

Example 7.

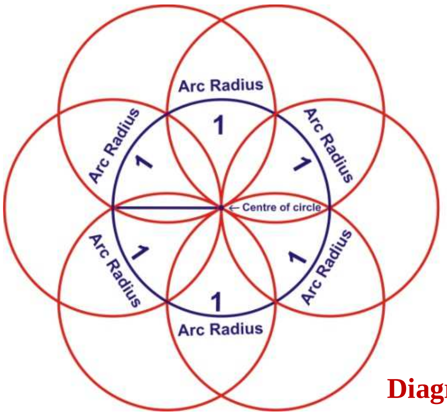


Diagram No.13

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.14

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

8. Measure of Radius: Distance between two apex of the measure of radius means sum of measure of straight radius and measure of arc radius is called measure of radius and it is in 10^0 measure according to construction.

OR

Constant No.2: S.S.J. Constant = Measure of radius = Measure of straight radius + Measure of arc radius

$= 4^0 + 6^0 = 10^0$ = Measure of radius

By this radius however it may be small or large in the sense of measure they are congruent.

In constant No. 2. S.S.J. constant means Suvernesh Shantaram Janorkar

Example 8.

Measure of radius = Measure of straight radius + Measure of arc radius

$= 4^0 + 6^0 = 10^0$ Measure of radius

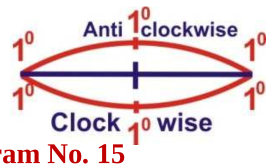
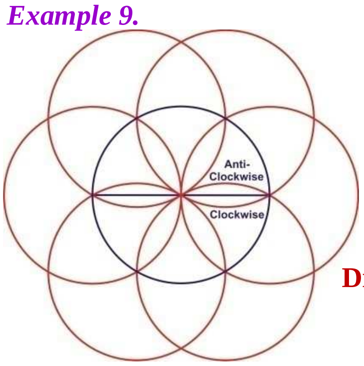


Diagram No. 15

9. Diameter: It is a line segment (straight and arcual) passing through the center of the circle joining the opposite centers of the firstly constructed circles and making two equal part of the Circumference of circle.

Example 9.



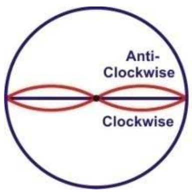


Diagram No.16

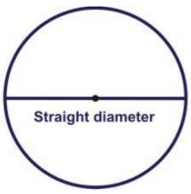


Diagram No. 17

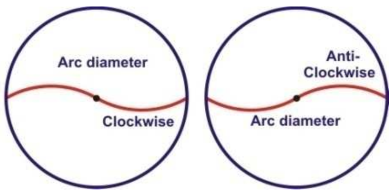


Diagram No. 18

10. Straight diameter: It is segment passing through the center of the circle joining the opposite centers of firstly constructed circles and making two equal parts of circumference of circle is called straight diameter.

Example 10.

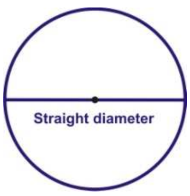


Diagram No.19

11. Arc diameter: It is an arc passing through the center of the circle, in clockwise or anticlockwise direction joining opposite centers of firstly constructed circles and making two equal parts of circumference of circle is called arc diameter.

Example 11.

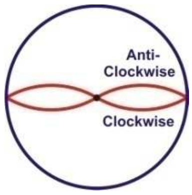


Diagram No. 20

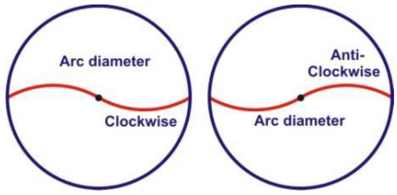


Diagram No. 21

12. System of homogeneous circle: As per sector of circumference of circle curve radius and curve diameter is called system of homogeneous circle.

Example 12.

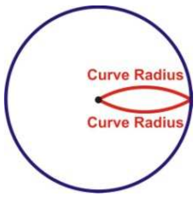


Diagram No. 22

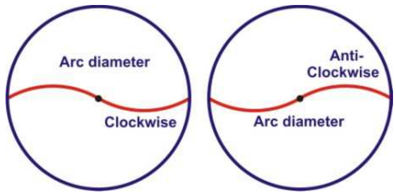


Diagram No. 23

13. System of anti-homogeneous circle: As per sector of circumference of circle straight radius and straight diameter is called system of anti- homogeneous circle.

Example 13.

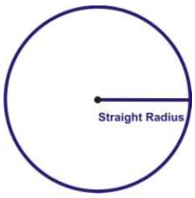


Diagram No. 24

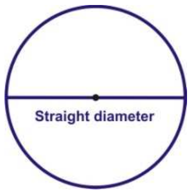


Diagram No. 25

14. Measure of circumference: It is multiplication of measure of centre of circle and measure of radius is called measure of circumference.

OR

Measure surrounding the measure of centre of circle is called measure of Circumference.

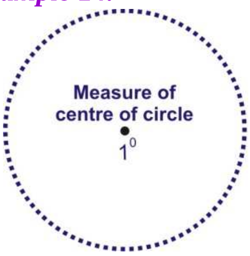
OR

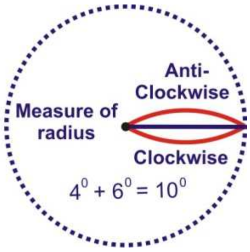
Constant No.3: D.S.J. Constant of measure of Circumference = Measure of centre of circle x Measure of radius / S.S.J.

$= 1^0 \text{ x } 10^0 = 10^0$ measure of Circumference

In constant No. 3. D.S.J. constant means Dhananjay Shantaram Janorkar

Example 14.





$1^0 \text{ x } 10^0 = 10^0$ measure of Circumference

Diagram No. 26 **Diagram No. 27**

Measure of Radius Using Diagram No. 28

Measure of radius = Measure of straight radius + Measure of arc radius

= 4^0 + 6^0 = 10^0 Measure of radius

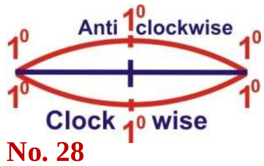


Diagram No. 28

15. Circle: Around the measure of centre of circle, up to the equil distance of radius means 6^0 measure of centre of circle of construction means up to circumference of circle completely circular and in the one plane of diagram is called circle.

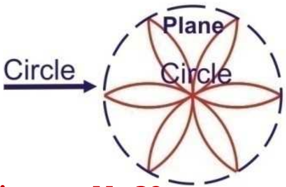
OR

A circle is a locus of a point in the plane such that its distance from a fixed point is always constant. Constant distance is called radius and fixed point is called centre.

OR

The circle is a locus of a point such that it distance from fixed point is always constant, constant distance is called radius and fixed point is called centre of the circle.

Example 15.



Circle in 6 centre of circle of construction means plane.

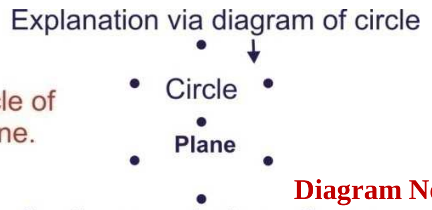


Diagram No.29 **Diagram No.30**

Plane :- A perfectly round plane figure

16. Measure of circle: Measure of plane is called measure of circle. And it is in Measure of 36^0.

OR

Measure around the centre of circle is called measure of circle. And it is in Measure of 36^0.

OR

Constant No.4: J.D.J. Constant of measure of circle = 3^0 x 4^0 x 3^0 = 36^0 Constant of measure of circle

In constant No. 4. J.D.J. constant means Jija Dhananjay Janorkar

Example 16.

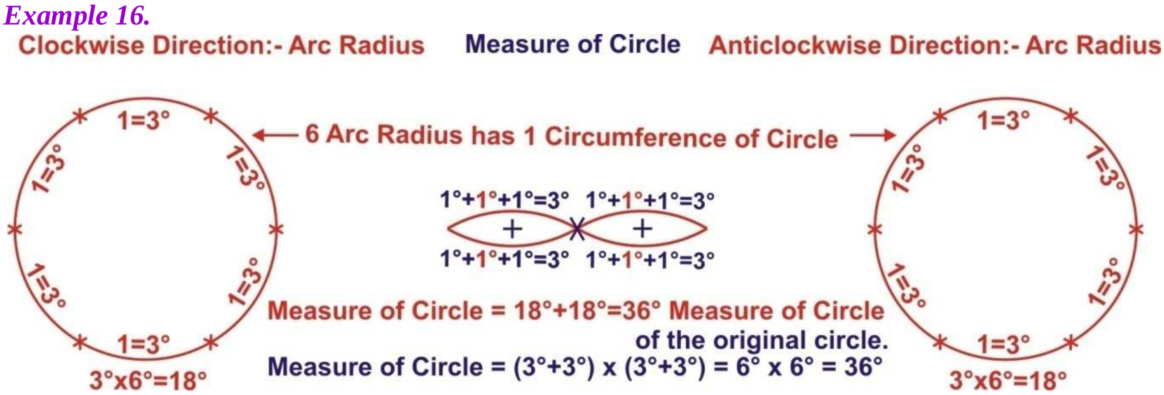


Diagram No.31

17. Center of circle: The fixed point at the middle of the circle is called its centre.

OR

The place at the centre of a circle is called the centre of circle.

Example 17.

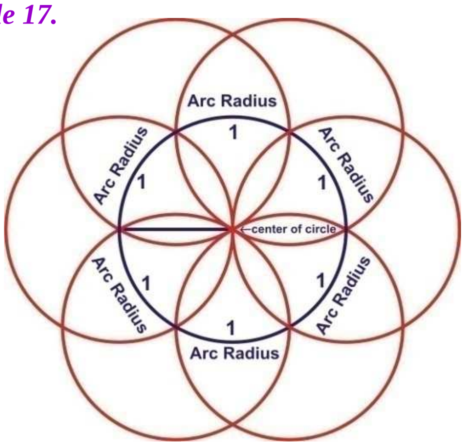


Diagram No. 32

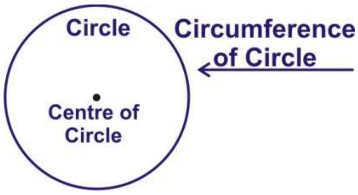


Diagram No. 33

18. Measure of centre: Measure of the fixed point at the middle of the circle is called its measure of centre. And measure of centre of circle is 1^0 one Degree.

Example 18.

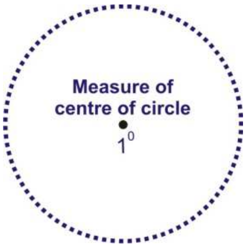


Diagram No. 34

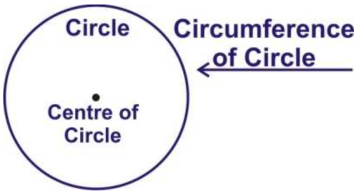


Diagram No. 35

19. Circumference of circle: Circle surround the circular line is called Circumference of circle. OR
The circumference of a circle is the distance around it. The term is used when measuring physical objects, as well as when considering abstract geometric forms. OR
A wire ring as shown in figure, we can break this ring at any point on it, straighten out the wire and measure its length. This length is called the circumference of the circle.

Example 19.

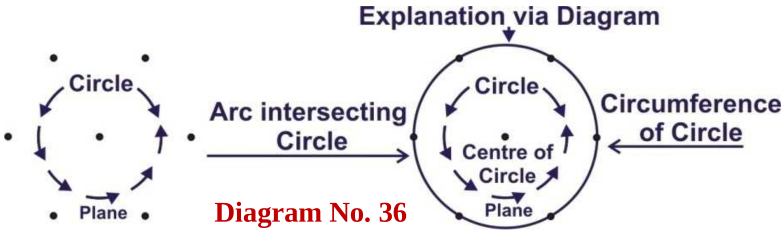


Diagram No. 36

20. Measure of circumference of circle: Circle surrounds the measure of circumference means multiplication of measure of circle and measure of Circumference is called measure of circumference of circle.

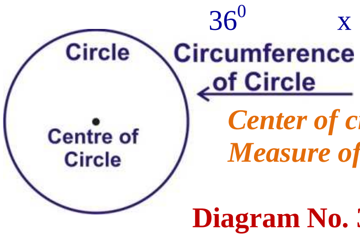
OR

Constant No.5: S.D.J. / Ja.D.J. Constant measure of Circumference of circle
= J.D.J. x D.S.J. Constant
= 36^0 x 10^0 = 360^0 Measure of circumference of circle
In constant No. 5. S.D.J./Ja.D.J. constant means Shiva Dhananjay Janorkar Alias Jay Dhananjay Janorkar

Example 20.

Formula: Measure of circle x Measure of Circumference = Measure of circumference of circle

36^0 x 10^0 = 360^0 Measure of circumference of circle

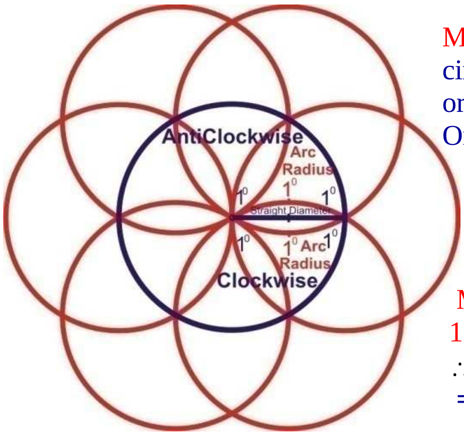


Center of circle: - The fixed point at the middle of the circle is called its centre.

Measure of centre: - Measure of the fixed point at the middle of the circle is called its measure of centre of circle. And measure of centre of circle is 1^0 one Degree.

Diagram No. 37

Construction from original Measure of radius to measure of circumference of circle



Measure of 24 arc radius outside the original circumference of circle is of 12 arc radius interior of original circumference of circle.

Original measure of radius = Measure of straight radius + Measure of arc radius

$= (1^0 + 1^0) + (1^0 + 1^0 + 1^0)$

$= 2^0 + 3^0 = 5^0$

For construction measure of radius = 5^0 x 2^0 = 10^0

Measure of 24 arc radius = 24 x 3^0 = 72^0 this is measure of 12 arc radius interior of original circumference of circle

$\therefore$ 24 **x** 3^0 = 72^0 Therefore measure of one arc radius = 12 **:** 1 **::** 72^0

Measure of arc radius $= \dfrac{1 \times 72^0}{12} = 6^0$ clockwise and anticlockwise direction.

Diagram No.38

Original circumference of circle is divided into 6 arc radius By virtue of construction of 6 circumference of circle. from this measure of circle.

$\therefore$ Measure of circle = 1 **:** 6 **::** 6^0 $= \dfrac{6 \times 6^0}{1} = 36^0$ *Measure of circle*

As per 6 arc radius has 1 centre of circle

$\therefore$ 12 arc radius has centre of circle = 6 : 12 :: 1^0 $= \dfrac{12 \times 1^0}{6} = 2^0$ *Measure of centre of circle*

Measure of 12 arc radius interior of original circumference of circle is of 6 arc radius of original circumference of circle.

$\therefore$ Measure of circle = 12 arc radius x 3^0 = 36^0 from this Measure of arc radius

$\therefore$ Measure of circle = 6 **:** 1 **::** 36^0 Measure of arc radius $= \dfrac{1 \times 36^0}{6} = 6^0$ clockwise and anticlockwise direction.

Circumference of circle as per one radius 5^0, 24 radius has measure?

This is measure of 12 arc radius interior.

= 1 **:** 24 **::** 5^0 $= \dfrac{24 \times 5^0}{1} = 120^0$ This is measure of 12 arc radius interior of original circumference of circle

Measure of radius = 12 **:** 1 **::** 120^0 $= \dfrac{1 \times 120^0}{12} = 10^0$ *Measure of radius*

Measure of circumference = Measure of centre of circle x Measure of radius

1^0 x 10^0 = 10^0 Measure of circumference

Measure of circumference 10^0 this is original circumference of circle and 1^0 Measure of centre

1^0 centre of circle has 10^0 circumference therefore how many measure of centre of circumference of 6^0 centre of circle of construction on the original circumference of circle?

$1^0 : 6 :: 10^0$ Measure of circumference $= \dfrac{6 \times 10^0}{1} = 60^0$ *Original circumference of circle*

Measure of circumference of circle = 1^0 has 60^0 Therefore how many degrees of 6^0 centre of circle of construction.

$1^0 : 6^0 :: 60^0 \quad = \dfrac{6^0 \times 60^0}{1^0} = 360^0$ *Original circumference of circle*

Measure of arc radius as per Measure of circumference of circle

$$= \frac{360^0}{6^0 \, Original\ arc\ radius} = 60^0 \text{ of } circumference\ of\ circle$$

OR

Measure of Radius = Measure of straight radius + Measure of arc radius

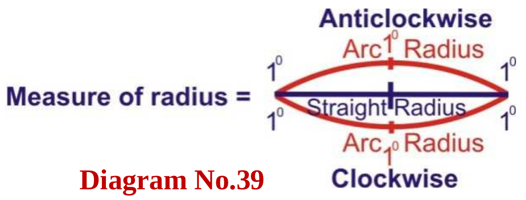


Diagram No.39

Measure of Straight radius = Clockwise + Anticlockwise

$= (1^0 + 1^0) + (1^0 + 1^0)$

$= 2^0 + 2^0 = 4^0$ Measure of Straight radius

Measure of Arc radius = Clockwise + Anticlockwise

$= (1^0 + 1^0 + 1^0) + (1^0 + 1^0 + 1^0)$

$= 3^0 + 3^0 = 6^0$ Measure of Arc radius

Measure of Radius = Measure of straight radius + Measure of arc radius

$= 4^0 + 6^0 = 10^0$ Measure of radius

Measure of circumference = Measure of centre of circle x Measure of radius

$= 1^0 \text{x } 10^0 = 10^0$ Measure of circumference

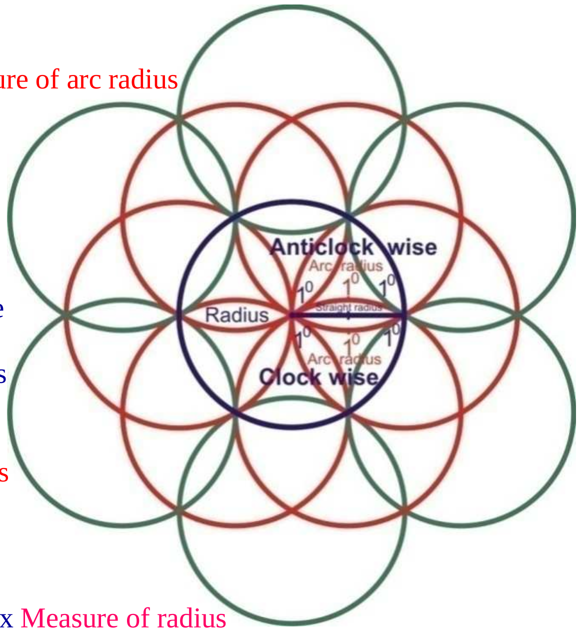


Diagram No.40

Measure of circle = 6 Arc radius + Measure of arc radius

$= \quad 6^0 \quad + \quad 6^0 \quad = 10^0$ Measure of circle

Measure of circumference of circle = Measure of circle x Measure of circumference

$= 36^0 \text{ x } 10^0 = 360^0$ Measure of circumference of circle

21. Goba: $\ominus$ = Angle made by end points of the diameter on the circumference of circle at two points at a distance equal to radius is 9^0, as per measure of circle. Measure of two such angle is 18^0 and it is in half of circle, it is called "Goba".

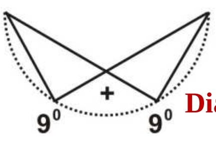
Example 21.

As per measure of circle:

Measure of circle = $2\ominus = 2 \text{ x } 18^0 = 36^0$ Measure of circle

$$\ominus = Goba = \frac{Measure\ of\ circle}{2} = \frac{36^0}{2} = 18^0 \ominus$$

Goba = $36^0 \div 2^0 = 18^0$ =



$= 9^0 + 9^0 = 18^0$ Goba

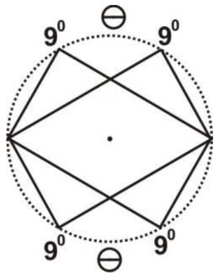


Diagram No.41

22. Goba radian: $\ominus^c$ = Angle made by end points of the diameter on the circumference of circle at two points at a distance equal to radius is 90^0, as per measure of circumference of circle. Measure of two such angle is 180^0 and it is in half of circumference of circle, it is called "Goba radian".

OR

Adition of measure of two right angle triangle on the diameter on the half circumference is called "Goba radian". This angle are of measurement $90^0 + 90^0 = 180^0$

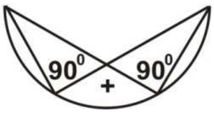
Example 22.

As per measure of circumference of circle:

Measure of circumference of circle = $2 \ominus^c = 2 \times 180^0 = 360^0$

$$\ominus^c = Goba\ Radian = \frac{Measure\ of\ circumference\ of\ circle}{2} = \frac{360^0}{2} = 180^0 = \ominus^C\ Goba\ Radian$$

Goba Radian = $360^0 \div 2^0 = 180^0$ =



$=90^0+90^0=180^0$ Goba Radian

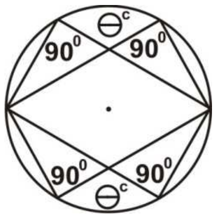


Diagram No.42

Constant No.6: Su.S.J. Constant. This constant convert the value of Goba, obtained as per arc diameter in to the value of the Goba obtained as per diameter or converse the value of the Goba obtained from arc diameter.

= circumference of circle ÷ diameter = 6 ÷ 2 = 3, the value of Goba

The value of Goba obtained from diameter

= circumference of circle ÷ diameter = $6283185306^0 \div 2^0 = 3.141592653^0$ Constant of Goba

Constant of measure of arc radies = Measure of arc radies, Ratio of arc radius to straight radius

Straight radius = 1000000000^0

Arc radius = 1047197551^0

Ratio

$$\frac{Arc.Radius}{straight\ radius} = \frac{1047197551^0}{1000000000^0} = 1.047197551^0 \text{ Su.S.J. Constant}$$

The value of the Goba obtained from arc diameter 3^0 x Su.S.J. Constant

$3^0 = 3^0 \times 1.047197551^0 = 3.141592653^0$ the value obtained from diameter

Conversely, arc diameter = the value obtained from diameter ÷ Su.S.J. Constant

$$3^0 = \frac{3.141592653^0}{1.047197551^0} = 3^0 \text{ The value of Goba}$$

In constant No. 6. Su.S.J. constant means Sulabha Shantaram Janorkar

Constant No.7: Jn.D.J. Constant denote the distance of thundering Cloud from the earth

In constant No. 7. Jn.D.J. constant means Janhavi Dhananjay Janorkar

***Explanation:* - Goba means Godavari Bapurao**

Late Godavari Bapurao Janorkar and Late Bapurao Uttamrao Janorkar

Example 23.

The symbol of Goba:

Goba: $\ominus = \frac{\odot}{\text{—}} = \frac{\text{Circumference of Circle}}{\text{Diameter}} = \frac{GO}{BA} = GOBA$

To make the concept of circumference of circle and diameter clear, the symbol ⊖ was created by Late Mr. Shantaram Bapurao Janorkar and it was ginven a name as "Goba."

If we see the symbol, ⊖ we can see that the circumference looks round and his mother's and my grandmother's name is "Godavari." The characters **"Go"** in the word and in round ◯ (Golakar in Marathi) and Godavari are the indicators of circumference of a circle ⨀ while diameter is a straight line or side, ____ and his father's and my grandfather's name is "Bapurao." The characters **"Ba"** in the word, side (Baju in Marathi) and Bapurao indicate a diameter.

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653

Theorem 1. *If one Circumference of circle is to be made from 6 Arc radius, Then 6 Arc OR 6 Arc radius* x *1.047197551 = 6.283185306 Circumference of circle*

Proof.

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653

ℓ (Arc A G B), ℓ (Arc B H C),
ℓ (Arc D I C), ℓ (Arc E J D),
ℓ (Arc F K E),

$$\ell\,(\text{Arc F L A}) = \frac{\theta}{360^0} \times 2 ⊖ r_s$$

$$= \frac{60^0}{360^0} \times 2 \times 3.141592653 \times 1\ \textit{Unit}$$

$$= \frac{60^0 \times 2 \times 3.141592653 \times 1\ \textit{Unit}}{360^0}$$

$$= \frac{376.99111836\,\textit{Unit}}{360}$$

= 1.047197551 Unit Length of one arc
means one arc radius, as per first construction

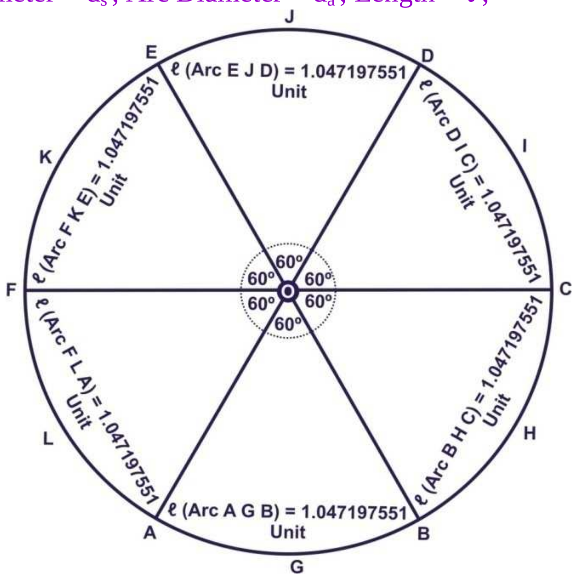


Diagram No.43
(1 Circumference of circle is to be made from 6 Arc radius)

OR

ℓ (Arc A G B), ℓ (Arc B H C), ℓ (Arc D I C), ℓ (Arc E J D), ℓ (Arc F K E),

$$\ell\,(\text{Arc F L A}) = \frac{\theta ⊖ r_s}{180^0}$$

$$= \frac{60^0 \times 3.141592653 \times 1 \quad \textit{Unit}}{180^0}$$

$$= \frac{188.49555918 \quad \textit{Unit}}{180}$$

= 1.047197551 Unit Length of one arc means one arc radius, as per first Construction

ℓ (Arc A G B) = 1.047197551 Unit
ℓ (Arc B H C) = 1.047197551 Unit
ℓ (Arc D I C) = 1.047197551 Unit
ℓ (Arc E J D) = 1.047197551 Unit
ℓ (Arc F K E) = 1.047197551 Unit
ℓ (Arc F L A) = 1.047197551 Unit
6 Arc OR 6 Arc radius x 1.047197551 Unit = 6.283185306 Unit Circumference of circle

Ratio of arc radius to straight radius

$$\frac{\textit{Arc Radius}}{\textit{Straight Radius}} = \frac{1047197551^0}{1000000000^0} = \frac{1.047197551^0}{1^0} = 1.047197551 \text{ Su.S.J. Constant}$$

Ratio

Straight Radius 1 : 1.047197551 Arc Radius

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 = 6.283185306^0 Circumference of circle

$$\ominus = Goba = \frac{\textit{Circumference of circle}}{\textit{Straight diameter}} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Example 1.

Straight Radius = r_s, Arc Radius = r_a, Straight Diameter = d_s, Arc Diameter = d_a, Length = ℓ, Goba = 3.141592653

For example we consider straight radius 5 c.m.

ℓ (Arc A G B), ℓ (Arc B H C),
ℓ (Arc D I C), ℓ (Arc E J D),
ℓ (Arc F K E),

$$\ell \text{ (Arc F L A)} = \frac{\theta}{360^0} \times 2\ominus r_s$$

$$= \frac{60^0}{360^0} \times 2 \times 3.141592653 \times 5\ c.m.$$

$$= \frac{60^0 \times 2 \times 3.141592653 \times 5\ c.m.}{360^0}$$

$$= \frac{1884.9555918 c.m.}{360}$$

= 5.235987755 c.m. Length of one arc means one arc radius, as per first construction

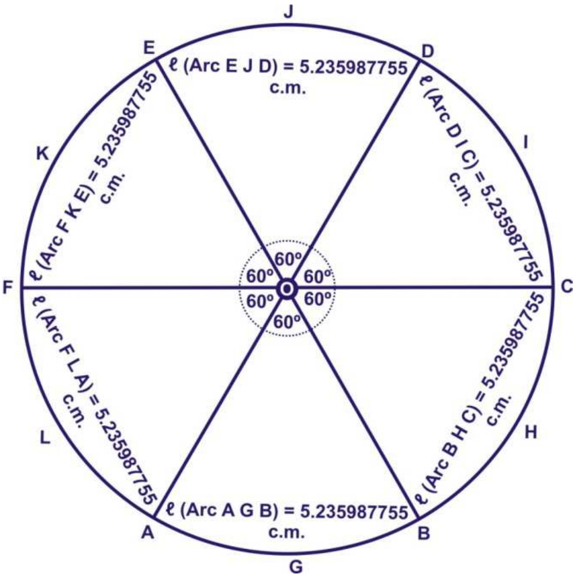


Diagram No.44

(1 Circumference of circle is to be made from 6 Arc radius)

ℓ (Arc A G B) = 5.235987755 c.m.
ℓ (Arc B H C) = 5.235987755 c.m.
ℓ (Arc D I C) = 5.235987755 c.m.
ℓ (Arc E J D) = 5.235987755 c.m.
ℓ (Arc F K E) = 5.235987755 c.m.
ℓ (Arc F L A) = 5.235987755 c.m.

6 Arc OR 6 Arc radius x 5.235987755 c.m. = 31.41592653 c.m. Circumference of circle

Exercise :

(i). Find Circumference of circle whose straight radius is 14 c.m.
(Ans: 87.964594284 c.m.).
(ii). Find Circumference of circle whose straight radius is 16 metre.
(Ans: 100.530964896 metre).

Example 2.

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s ,
Arc Diameter = d_a , Length = ℓ , Goba = 3.141592653

For example we consider straight radius 7 c.m.
ℓ (Arc A G B), ℓ (Arc B H C),
ℓ (Arc D I C), ℓ (Arc E J D),
ℓ (Arc F K E),

$$\ell\text{ (Arc F L A)} = \frac{\theta \ominus r_s}{180^0}$$

$$= \frac{60^0 \times 3.141592653 \times 7\ c.m.}{180^0}$$

$$= \frac{1319.46891426\ c.m.}{180}$$

= 7.330382857 c.m. Length of one arc means one arc radius, as per first Construction

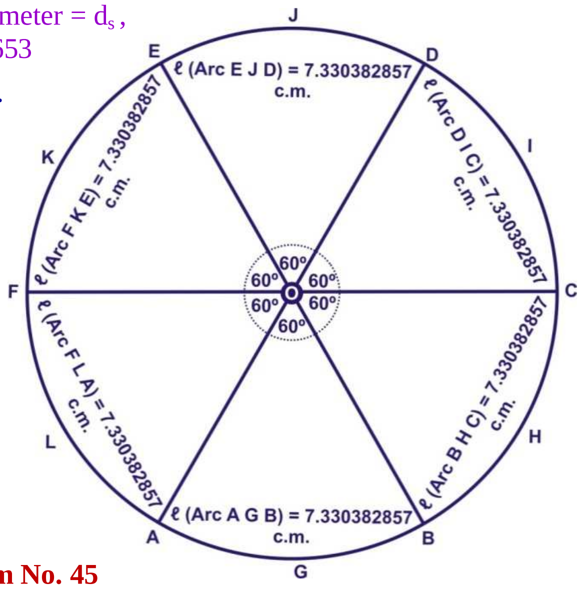


Diagram No. 45
(1 Circumference of circle is to be made from 6 Arc radius)

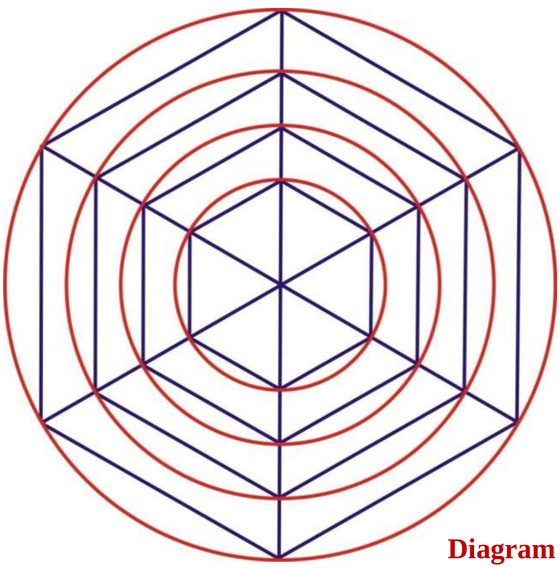
ℓ (Arc A G B) = 7.330382857 c.m.
ℓ (Arc B H C) = 7.330382857 c.m.
ℓ (Arc D I C) = 7.330382857 c.m.
ℓ (Arc E J D) = 7.330382857 c.m.
ℓ (Arc F K E) = 7.330382857 c.m.
ℓ (Arc F L A) = 7.330382857 c.m.
6 Arc OR 6 Arc radius x 7.330382857 c.m. = 43.982297142 c.m. Circumference of circle

Exercise :

(i). Find Circumference of circle whose straight radius is 6 c.m.
(Ans: 37.699111836 c.m.).
(ii). Find Circumference of circle whose straight radius is 11 metre.
(Ans: 69.115038366 metre).

Theorem 2. *All circles are congruent: - congruency*
No Infinite, No Infinity. No infinite then all these are finite.

Proof.



In every circle there are 6 equilateral tringles.

Sides of the equilateral tringles are the radius of the circle and the three angles are equal of 60^0.

Here ends the Infinity. It is a finite.

Radius of the circle however it may be small or large, all the circles are similar.

Goba of any circle = ⊖ = circumference of circle ÷ **s**traight diameter = 3.141592653 is so much.

Diagram No.46

All circles are congruent:- congruence
Infinite = And + End = Infinite

End of speed = Static

And = Dynamic

End = Static

Equilateral tringles $6^0 + 6^0 + 6^0 = 18^0$

Measure of circle = $6^0 + 6^0 + 6^0 + 6^0 + 6^0 + 6^0 = 36^0$

These or this arrow
Shows how many universe is large, the arrow is upto the end.
Equilateral tringles $60^0 + 60^0 + 60^0 = 180^0$

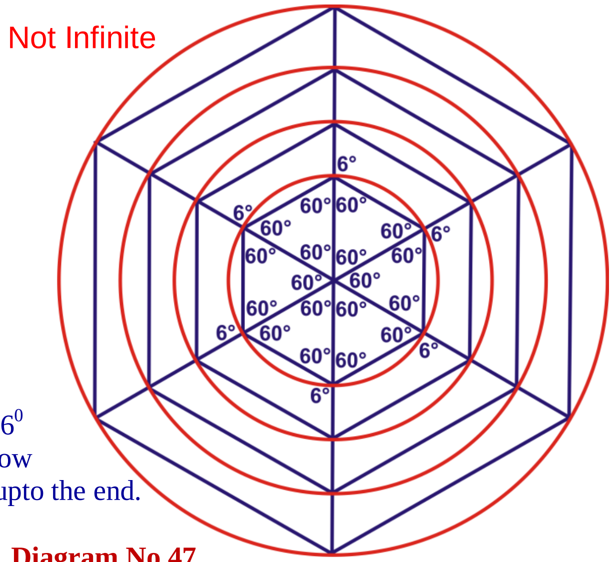


Diagram No.47

Measure of Circumference of circle = $60^0 + 60^0 + 60^0 + 60^0 + 60^0 + 60^0 = 360^0$ Measure of Circumference of circle

In this mathematical procedure arc radius and radius are not seen no proportional. Arc radius is in proportional with straight radius. Therefore circumference of circle is in proportional to diameter.

Example 3. ***Both circles are congruent:***

Straight Radius = r_s, Arc Radius = r_a, Straight Diameter = d_s, Arc Diameter = d_a, Length = ℓ, Goba = 3.141592653

For example we consider straight radius 11 c.m. and 7 c.m.

ℓ (Arc A G B), ℓ (Arc B H C), ℓ (Arc D I C), ℓ (Arc E J D), ℓ (Arc F K E),

$$\ell\text{ (Arc F L A)} = \frac{\theta}{360^0} \times 2\ominus r_s$$

$$= \frac{60}{360} \times 2 \times 3.141592653 \times 11\ c.m.$$

$$= \frac{60 \times 2 \times 3.141592653 \times 11\ c.m.}{360}$$

$$= \frac{4146.90230196\ c.m.}{360}$$

= 11.519173061 c.m. Length of one arc means one arc radius, as per first Construction.
6 Arc OR 6 Arc radius x 11.519173061 c.m.
Length of one arc radius = 69.115038366 c.m.
Circumference of circle.

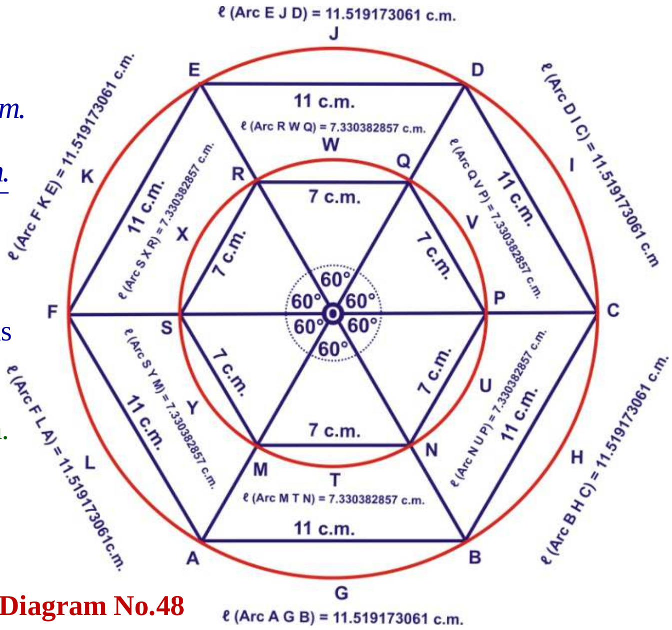


Diagram No.48

ℓ (Arc M T N), ℓ (Arc N U P), ℓ (Arc Q V P),
ℓ (Arc R W Q), ℓ (Arc S X R),

$$\ell\text{ (Arc S Y M)} = \frac{\theta}{360^0} \times 2\ominus r_s$$

$$= \frac{60}{360} \times 2 \times 3.141592653 \times 7\ c.m.$$

$$= \frac{60 \times 2 \times 3.141592653 \times 7\ c.m.}{360}$$

$$= \frac{2638.93782852\ c.m.}{360}$$

= 7.330382857 c.m. Length of one arc means one arc radius, as per first Construction.
6 Arc OR 6 Arc radius x 7.330382857 c.m. Length of one arc radius = 43.982297142 c.m. Circumference of circle.

Circumference of circle in degrees = 360^0
As per the first construction, the measure of one part of the circumference of circle between two straight radii is 60^0, therefore, the total measure of six parts of a circumference of circle are, 60^0 X 6 = 360^0 or 6 parts consisting of 60^0 each makes a circumference of circle.

Straight radius and arc radius of the circle however it may be small or large, both the circles are similar.
Verification of, how the arc radius is proportional to straight radius. Therefore, circumference of circle is proportional to diameter.

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{11.519173061\ c.m.}{11\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{7.330382857\ c.m.}{7\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 Su. S. J. Constant = 6.283185306^0
Circumference of circle

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Exercise:

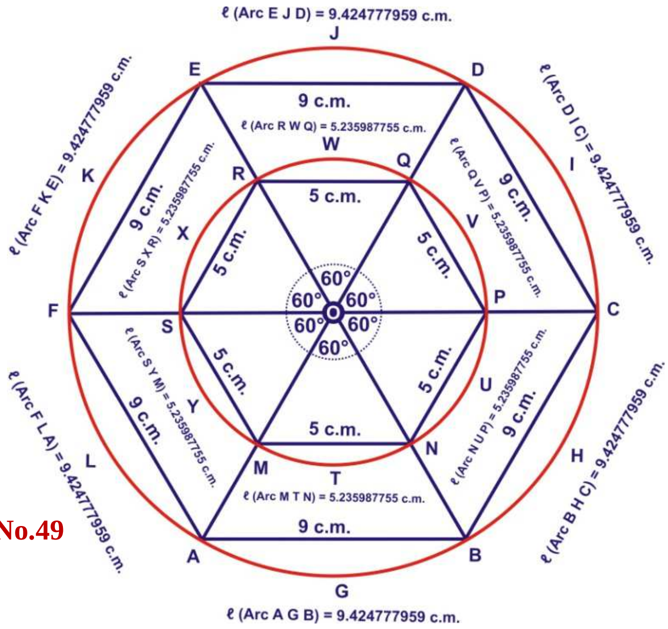
(i). Find Circumference of circle whose straight radius is 14 c.m. and 21 c.m. and Verify it.
(*Ans:* straight radius 14 c.m. whose circumference of circle is 87.964594284 c.m. and straight radius 21 c.m. whose circumference of circle is 131.946891426 c.m. and both verified, come out 1.047197551 Su.S.J.Constant).
(ii). Find Circumference of circle whose straight radius is 13 metre and 17 metre and Verify it.
(*Ans:* straight radius 13 metre whose circumference of circle is 81.681408978 metre and straight radius 21 metre whose circumference of circle is 131.1946891426 metre and both verified, come out 1.047197551 Su.S.J.Constant).

Example 4. ***Both circles are congruent:***
Straight Radius = r_s, Arc Radius = r_a, Straight Diameter = d_s, Arc Diameter = d_a, Length = ℓ,
Goba = 3.141592653
For example we consider straight radius 9 c.m. and 5 c.m.

ℓ (Arc A G B), ℓ (Arc B H C), ℓ (Arc D I C), ℓ (Arc E J D), ℓ (Arc F K E),

$$\ell\ (\text{Arc F L A}) = \frac{\theta \ominus r_s}{180} = \frac{60^0 \times 3.141592653 \times 9 c.m.}{180^0} = \frac{1696.46003262 c.m.}{180}$$

= 9.424777959 c.m.



= 9.424777959 c.m. Length of one arc means one arc radius, as per first Construction.
6 Arc OR 6 Arc radius x 9.424777959 c.m.
Length of one arc radius = 56.548667754 c.m.
Circumference of circle.

ℓ (Arc M T N), ℓ (Arc N U P), ℓ (Arc Q V P),
ℓ (Arc R W Q), ℓ (Arc S X R),

Diagram No.49

$$\ell\ (\text{Arc S Y M}) = \frac{\theta \ominus r_s}{180}$$

$$= \frac{60^0 \times 3.141592653 \times 5 c.m.}{180^0}$$

$$= \frac{942.4777959 c.m.}{180}$$

= 5.235987755 c.m.

= 5.235987755 c.m. Length of one arc means one arc radius, as per first Construction.
6 Arc OR 6 Arc radius x 5.235987755 c.m. Length of one arc radius = 31.41592653 c.m. Circumference of circle.

Circumference of circle in degrees = 360^0

As per the first construction, the measure of one part of the circumference of circle between two straight radii is 60^0, therefore, the total measure of six parts of a circumference of circle are, 60^0 X 6 = 360^0 or 6 parts consisting of 60^0 each makes a circumference of circle.

Straight radius and arc radius of the circle however it may be small or large, both the circles are similar.
Verification of, how the arc radius is proportional to straight radius. Therefore, circumference of circle is proportional to diameter.

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{9.424777959\ c.m.}{9\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{5.235987755\ c.m.}{5\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 Su. S. J. Constant = 6.283185306^0 Circumference of circle

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Exercise:

(i). Find Circumference of circle whose straight radius is 9 c.m. and 12 c.m. and Verify it.
(*Ans:* straight radius 9 c.m. whose circumference of circle is 56.548667754 c.m. and straight radius 12 c.m. whose circumference of circle is 75.398223672 c.m. and both verified, come out 1.047197551 Su.S.J.Constant).

(ii). Find Circumference of circle whose straight radius is 6 metre and 15 metre and Verify it.
(*Ans:* straight radius 6 metre whose circumference of circle is 6.283185306 metre and straight radius 15 metre whose circumference of circle is 94.24777959 metre and both verified, come out 1.047197551 Su.S.J.Constant).

Theorem 3. *Length of a circumference of a circle (with central angle θ is in radians)*

Proof.

$$\theta = 60^0 = 60^0 \times \frac{\ominus^C}{180^0} = \frac{60^0 \times 3.141592653^C}{180^0}$$

$$= \frac{188.49555918^C}{180}$$

$\theta = 1.047197551^C$ or
1.047197551 radians

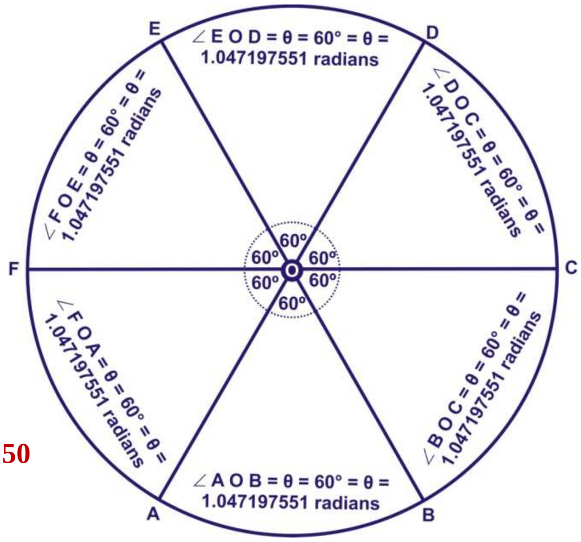


Diagram No.50

As per the first construction, the measure of one part of the circumference of a circle between two straight radii is 60^0, as per radians, which is 1.047197551^C or 1.047197551 radians.

$\angle$ A O B = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians
$\angle$ B O C = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians
$\angle$ D O C = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians
$\angle$ E O D = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians
$\angle$ F O E = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians
$\angle$ F O A = θ = 60^0 = θ = 1.047197551^C or 1.047197551 radians

$\angle$ 6 X 60^0 = 360^0 = θ 6 X 1.047197551^C = 6.283185306^C or 6.283185306 radians

$$\theta = 360^0 = 360 \times \frac{\ominus^C}{180} = \frac{360 \times 3.141592653^C}{180}$$

θ = 6.283185306^C or 6.283185306 radians

Circumference of circle in degrees = 360^0

As per the first construction, the measure of one part of the circumference of circle between two straight radii is 60^0, therefore, the total measure of six parts of a circumference of circle are, 60^0 X 6 = 360^0 or 6 parts consisting of 60^0 each makes a circumference of circle.

Circumference of circle in radians = 6.283185306^C or 6.283185306 radians

As per the first construction, the measure of one part of the circumference of circle between two straight radii is 1.047197551^C radians, therefore, the total radians of six parts of a circumference of circle are, 1.047197551^C radians X 6 = 6.283185306^C or 6.283185306 radians or 6 parts consisting of 1.047197551 radians each makes a circumference of circle.

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

As per the first construction, the measure of one part of the circumference of circle between two straight radii is 60^0, therefore, the total degrees of 6 parts of a circumference of circle are 60^0 X 6 = 360^0 or six parts consisting of 60^0 each make a circumference of circle and as per radians one part is 1.047197551 radians and from these six parts of radian one circumference of circle is created and it is 1.047197551 radians X 6 = 6.283185306 radians.

Example 5.

$$\theta = 60^0 = 60^0 \times \frac{\ominus^C}{180^0} = \frac{60^0 \times 3.141592653^C}{180^0} = \frac{188.49555918^C}{180}$$

θ = 1.047197551^C or 1.047197551 radians

For example we consider Straight radius = 5 c.m.

ℓ (Arc A G B) = $r_s\theta$

= 5 c. m. x 1.047197551

= 5.235987755 c.m. Length of one arc means one arc radius, as per first Construction

ℓ (Arc A G B) = 5.235987755 c.m.
ℓ (Arc B H C) = 5.235987755 c.m.
ℓ (Arc D I C) = 5.235987755 c.m.
ℓ (Arc E J D) = 5.235987755 c.m.
ℓ (Arc F K E) = 5.235987755 c.m.
ℓ (Arc F L A) = 5.235987755 c.m.

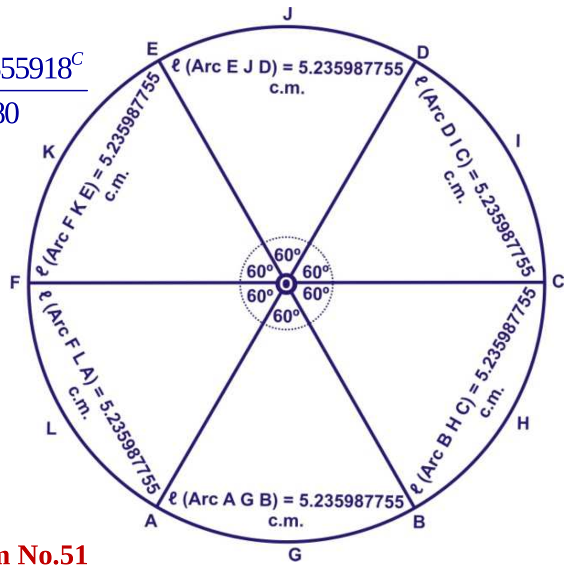


Diagram No.51

6 Arc OR 6 Arc radius x 5.235987755 c.m. = 31.41592653 c.m. Circumference of circle

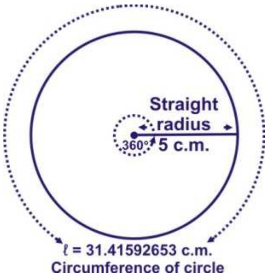
Exercise :

(i). Find Circumference of circle whose straight radius is 3 c.m.
(Ans: 18.849555918 c.m.).
(ii). Find Circumference of circle whose straight radius is 4 metre.
(Ans: 25.132741224 metre).

Example 6.

For example we consider Straight radius = 5 c.m.
If the angle θ is in radians, then length = r_s x θ

Diagram No.52



$$\theta = 360^0 = \frac{360^0 \times \ominus^C}{180^0}$$

$$= \frac{360^0 \times 3.141592653^C}{180^0}$$

$$= \frac{1130.97335508^C}{180}$$

θ = 6.283185306^C or 6.283185306 radians

If the angle 360° is in 6.283185306 radians, then length = 5 c.m. x 6.283185306 radians

ℓ = 31.41592653 c.m. Circumference of circle

Example 7.

For example we consider Straight radius = 9 c.m.
If the angle θ is in radians, then length = r_s x θ

$$\theta = 360^0 = \frac{360^0 \times \ominus^C}{180^0}$$

$$= \frac{360^0 \times 3.141592653^C}{180^0}$$

$$= \frac{1130.97335508^C}{180}$$

θ = 6.283185306^C or 6.283185306 radians

Diagram No.53

If the angle 360° is in 6.283185306 radians, then length = 9 c.m. x 6.283185306 radians

ℓ = 56.548667754 c.m. Circumference of circle

Exercise :

(i). Find Circumference of circle whose straight radius is 3 c.m.
(Ans: 18.849555918 c.m.).
(ii). Find Circumference of circle whose straight radius is 4 metre.
(Ans: 25.132741224 metre).

Chapter (Unit) … II

Arc Radius: Part - 2

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653

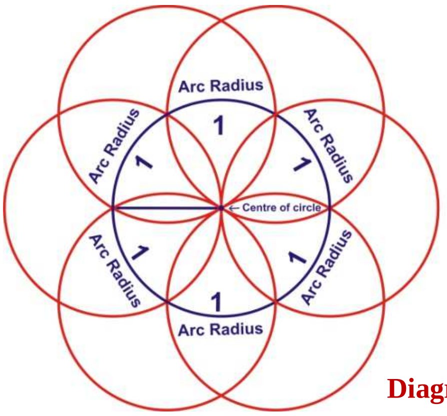


Diagram No.1

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)
Circumference of circle = 6 Arc radius

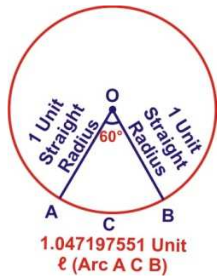
Theorem 1. *Length of a Circular Arc: (with central angle θ is in degrees)*

Proof.

If the angle θ is in degrees, then length = θ x (GOBA/180°) x r_s

If the angle 60° is in degrees, then length = 60° x (3.141592653/180°) x 1 Unit
= 60 x 0.0174532925166666666666666666667 x 1 Unit
= 1.047197551Unit

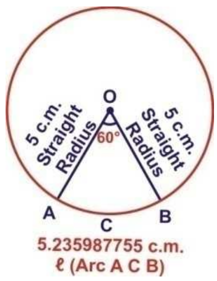
Diagram No.3



Example 1.

If the angle θ is in degrees, then length = θ x (GOBA/180) x r_s
For example we consider angle 60° and straight radius 5 c.m.
If the angle 60° is in degrees, then length = 60° x (3.141592653/180°) x 5 c.m.
= 60 x 0.0174532925166666666666666666667 x 5 c.m.
= 5.235987755c.m.

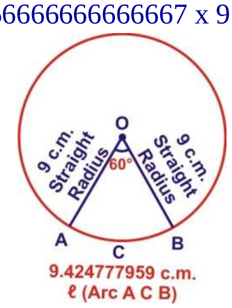
Diagram No.4



Example 2.

If the angle θ is in degrees, then length = θ x (GOBA/180) x r_s
For example we consider angle 60° and straight radius 9 c.m.
If the angle 60° is in degrees, then length = 60° x (3.141592653/180°) x 9 c.m.
= 60 x 0.0174532925166666666666666666667 x 9 c.m.
= 9.424777959 c.m.

Diagram No.5



Exercise :

(i). Find arc radius whose angle is 60° and straight radius is 4 c.m.
(Ans: 4.188790204 c.m.).
(ii). Find arc radius whose angle is 60° and straight radius is 6 metre.
(Ans: 6.283185306 metre).

Theorem 2. *Length of a Circular Arc: (with central angle θ is in radians)*

Proof.

If the angle θ is in radians, then length = r_s x θ

If the angle 60° is in radians, then length = 1 Unit x 60°

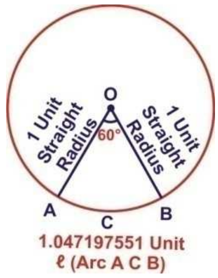
$$\theta = 60^0 = \frac{60^0 \times \ominus^C}{180^0}$$

$$\theta = 60° = \frac{60 \times 3.141592653^C}{180}$$

θ = 1.047197551 radians

If the angle 1.047197551 is in radians, then length = 1 Unit x 1.047197551 radians
= 1.047197551 Unit

Diagram No.6



Example 3.

If the angle θ is in radians, then length = r_s x θ

For example we consider angle 60° and straight radius 5 c.m.

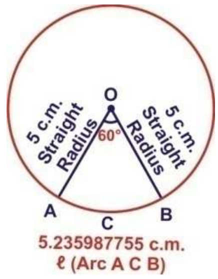
$$\theta = 60^0 = \frac{60^0 \times \ominus^C}{180^0}$$

$$\theta = 60° = \frac{60 \times 3.141592653^C}{180}$$

θ = 1.047197551 radians

If the angle 1.047197551 is in radians, then length = 5 c.m. x 1.047197551 radians
= 5.235987755 c.m.

Diagram No.7



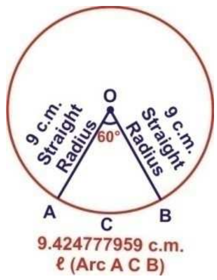
Example 4.

If the angle θ is in radians, then length = r_s x θ

For example we consider angle 60° and straight radius 9 c.m.

$$\theta = 60^0 = \frac{60^0 \times \ominus^C}{180^0}$$

Diagram No.8



$$\theta = 60° = \frac{60 \times 3.141592653^C}{180}$$

θ = 1.047197551 radians

If the angle 1.047197551 is in radians, then length = 9 c.m. x 1.047197551 radians
= 9.424777959 c.m.

Exercise:

(i). Find arc radius whose angle is 60° and straight radius is 19 c.m.
(Ans: 19.896753469 c.m.).
(ii). Find arc radius whose angle is 60° and straight radius is 22 metre.
(Ans: 23.038346122 metre).

Theorem 3. *Length of circular line of circumference of circle: (with central angle θ is in degrees)*

Proof.

If the angle θ is in degrees, then length of circular line of circumference of circle $= \dfrac{2\ominus\theta}{360^0}$

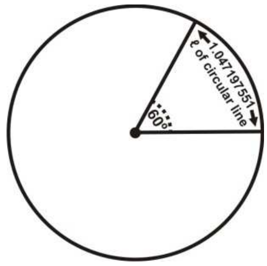
we consider angle θ = 60°

$$= \frac{2\times 3.141592653\times 60^0}{360^0}$$

$$= \frac{376.99111836}{360}$$

= 1.047197551 length of circular line of circumference of circle.

Diagram No.9



Example 5.

If the angle θ is in degrees, then length of circular line of circumference of circle $= \dfrac{2\ominus\theta}{360^0}$

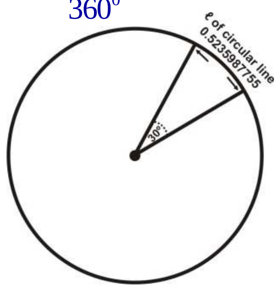
For example we consider angle θ = 30°

$$= \frac{2\times 3.141592653\times 30^0}{360^0}$$

$$= \frac{188.49555918}{360}$$

= 0.5235987755 length of circular line of circumference of circle.

Diagram No.10



Example 6.

If the angle θ is in degrees, then length of circular line of circumference of circle $= \dfrac{2\ominus\theta}{360^0}$

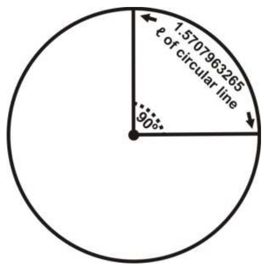
For example we consider angle θ = 90°

$$= \frac{2\times 3.141592653\times 90^0}{360^0}$$

$$= \frac{565.48667754}{360}$$

= 1.5707963265 length of circular line of circumference of circle.

Diagram No.11



Exercise:

(i). Find length of circular line of circumference of circle whose angle θ is 120°.
(Ans: 2.094395102 length of circular line of circumference of circle).
(ii). Find length of circular line of circumference of circle whose angle θ is 180°.
(Ans: 3.141592653 length of circular line of circumference of circle).

Chapter (Unit) … III

Arc Radius: Part - 3

Arc radius from Straight radius and Straight radius from Arc radius

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ , Goba = 3.141592653

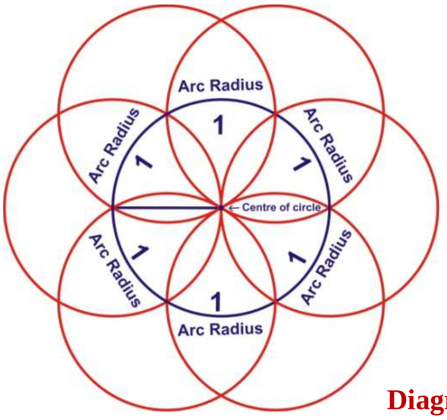


Diagram No.1

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Theorem 1. *Arc radius from Straight radius*

Proof.

To find the arc radius: If we have to find arc radius from straight radius, then, x Multiply the straight raidus taken, by the Su. S. J. constant 1.047197551 = the resultant number is arc radius.

Arc radius = The value of taken straight radius x 1.047197551 Su. S. J. constant

Arc radius = 1 Unit x 1.047197551 Su. S. J. constant

= 1.047197551 Unit, Arc radius

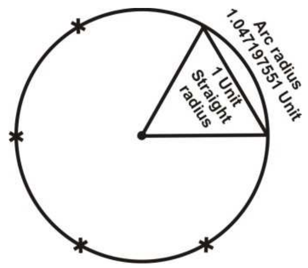


Diagram No.3

Example 1.

If the straight raidus is 5 c.m., then arc radius = The value of taken straight radius x 1.047197551 Su. S. J. constant

Arc radius = 5 c.m. x 1.047197551 Su. S. J. constant

= 5.235987755 c.m., Arc radius

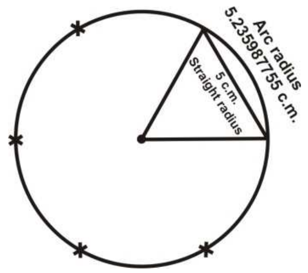


Diagram No.4

Example 2.

If the straight raidus is 9 c.m., then arc radius = The value of taken straight radius x 1.047197551 Su. S. J. constant

Arc radius = 9 c.m. x 1.047197551 Su. S. J. constant

= 9.424777959 c.m., Arc radius

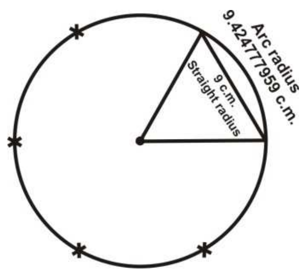


Diagram No.5

Exercise:

(i). Find arc radius whose straight radius is 7 c.m.
(Ans: 7.330382857 c.m. Arc radius).

(ii). Find arc radius whose straight radius is 11 c.m.
(Ans: 11.519173061 c.m. Arc radius).

Theorem 2. *Straight radius from Arc radius*

Proof.

To find the straight radius: If we have to find straight radius from arc radius, then, ÷ Divide the straight radius taken, by the Su. S. J. constant 1.047197551 = the resultant number is straight radius.

Straight radius = The value of taken arc radius ÷ 1.047197551 Su. S. J. constant

Straight radius = 1 Unit ÷ 1.047197551 Su. S. J. constant

= 0.95492965873 Unit, Straight radius

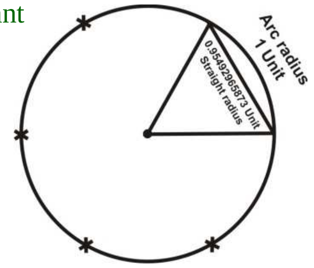


Diagram No.6

Example 3.

If the arc raidus is 5 c.m., then straight radius = The value of taken arc radius ÷ 1.047197551 Su. S. J. constant

Straight radius = 5 c.m. ÷ 1.047197551 Su. S. J. constant

= 4.77464829365 c.m., Straight radius

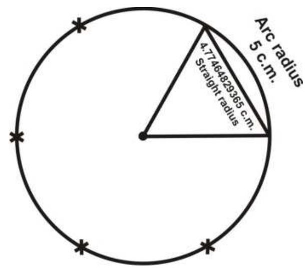


Diagram No.7

Example 4.

If the arc raidus is 9 c.m., then straight radius = The value of taken arc radius ÷ 1.047197551 Su. S. J. constant

Straight radius = 9 c.m. ÷ 1.047197551 Su. S. J. constant

= 8.59436692857 c.m., Straight radius

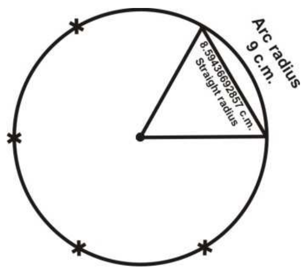


Diagram No.8

Exercise:

(i). Find straight radius whose arc radius is 7 c.m.
(Ans: 6.68450761111 c.m., Straight radius).
(ii). Find straight radius whose arc radius is 11 c.m.
(Ans: 10.504226246 c.m., Straight radius).

Theorem 3. *Straight radius of circumference of circle:*

Proof.

$$\text{Straight radius of circumference of circle} = \frac{\text{Length of arc radius} \times 360^0}{2 \ominus \times 60^0}$$

$$\text{If the length of arc radius is 5.235987755 Unit} = \frac{\text{Length of arc radius} \times 360^0}{2 \times \text{Goba} \times 60^0}$$

$$= \frac{5.235987755\ \text{Unit} \times 360^0}{2 \times 3.141592653 \times 60^0}$$

$$= \frac{1884.9555918\ \text{Unit}}{376.99111836}$$

= 5 Unit, Straight radius of circumference of circle.

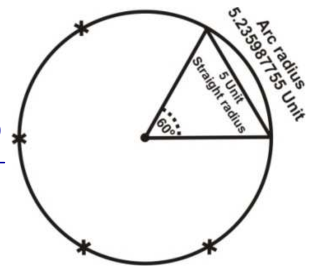


Diagram No.9

Verification of, how the arc radius is proportional to straight radius. Therefore, circumference of circle is proportional to diameter.

$$\frac{\text{Arc Radius}}{\text{Straight Radius}} = \frac{5.235987755\ \text{Unit}}{5\ \text{Unit}} = 1.047197551\ \text{Su. S. J. Constant}$$

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 Su. S. J. Constant = 6.283185306^0 Circumference of circle

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Example 5.

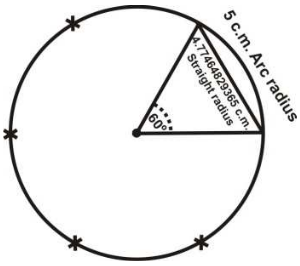


Diagram No.10

Straight radius of circumference of circle $= \frac{Length\ of\ arc\ radius \times 360^0}{2\ominus \times 60^0}$

If we consider the length of arc radius is 5 c.m. $= \frac{Length\ of\ arc\ radius \times 360^0}{2 \times Goba \times 60^0}$

$= \frac{5\ c.m. \times 360^0}{2 \times 3.141592653 \times 60^0}$

$= \frac{1800\ c.m.}{376.99111836}$

= 4.77464829365 c.m., Straight radius of circumference of circle.

Verification of, how the arc radius is proportional to straight radius. Therefore, circumference of circle is proportional to diameter.

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{5\ c.m.}{4.77464829365\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 Su. S. J. Constant = 6.283185306^0 Circumference of circle

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Example 6.

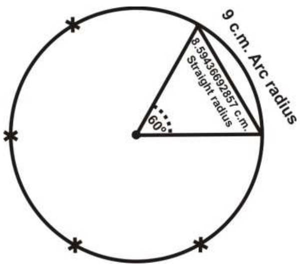


Diagram No.11

Straight radius of circumference of circle $= \frac{Length\ of\ arc\ radius \times 360^0}{2\ominus \times 60^0}$

If we consider the length of arc radius is 9 c.m. $= \frac{Length\ of\ arc\ radius \times 360^0}{2 \times Goba \times 60^0}$

$= \frac{9\ c.m. \times 360^0}{2 \times 3.141592653 \times 60^0}$

$= \frac{3240\ c.m.}{376.99111836}$

= 8.59436692857 c.m., Straight radius of circumference of circle.

Verification of, how the arc radius is proportional to straight radius. Therefore, circumference of circle is proportional to diameter.

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{9\ c.m.}{8.59436692857\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 Su. S. J. Constant = 6.283185306^0 Circumference of circle

$$\ominus = Goba = \frac{Circumference\ of\ circle}{Straight\ diameter} = \frac{6.283185306}{2} = 3.141592653\ Goba$$

Exercise:

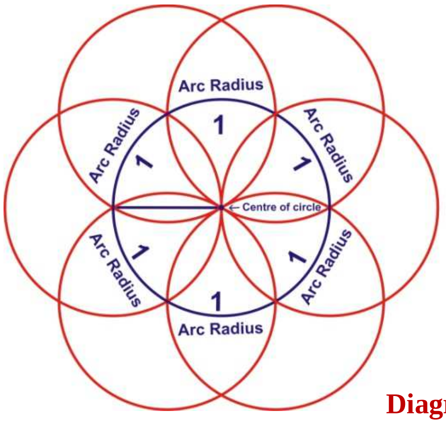
(i). Find straight radius of circumference of circle whose length of arc radius is 14 c.m. and Verify it.
(Ans: 13.3690152222 c.m. Straight radius of circumference of circle and verified, come out 1.047197551 Su.S.J.Constant).

(ii). Find straight radius of circumference of circle whose length of arc radius is 17 c.m.
(Ans: 16.2338041984 c.m. Straight radius of circumference of circle and verified, come out 1.047197551 Su.S.J.Constant).

Chapter (Unit) … IV

Formula of Arc Radius: Part - 4

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653



On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle **=** 6 Arc radius

Diagram No.1

Theorem 1.

The formula of arc radius by using straight radius:

Proof.

Straight Radius = 1 Unit

Circumference of circle = $2\ominus r_s$

= 2 x 3.141592653 x 1 Unit = 6.283185306 Unit

Formula of Arc Radius : $2\ominus r_s \div 6$ = 2 x Goba x Straight radius ÷ 6

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 1\ Unit}{6}$$

$$= \frac{6.283185306\ Unit}{6} = 1.047197551\ Unit \text{ Arc radius}$$

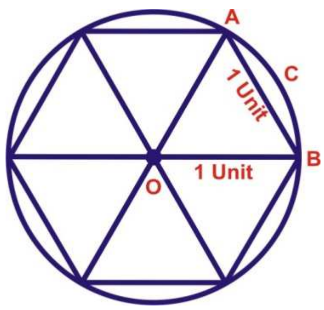


Diagram No.3

Example 1.

For example we consider straight radius = 5 c.m.

Circumference of circle = $2\ominus r_s$

= 2 x 3.141592653 x 5 c.m.

= 31.41592653 c.m. Circumference of circle

Formula of Arc Radius : $2\ominus r_s \div 6$ = 2 x Goba x Straight radius ÷ 6

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 5\ c.m.}{6}$$

$$= \frac{31.41592653\ c.m.}{6} = 5.235987755\ c.m. \text{ Arc radius}$$

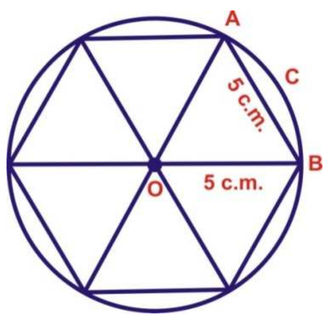


Diagram No.4

Example 2.

For example we consider straight radius = 9 c.m.

Circumference of circle = $2\ominus r_s$

= 2 x 3.141592653 x 9 c.m.

= 56.548667754 c.m. Circumference of circle

Formula of Arc Radius : $2\ominus r_s \div 6$ = 2 x Goba x Straight radius ÷ 6

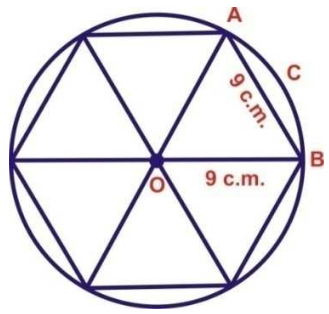


Diagram No.5

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 9 \ c.m.}{6}$$

$$= \frac{56.548667754 \ c.m.}{6} = 9.424777959 \ c.m. \ Arc\ Radius$$

Exercise : 1

(i). Find arc radius whose straight radius is 11 c.m.
(Ans:11.519173061).
(ii). Find arc radius whose straight radius is 15 metre.
(Ans:15.707963265).

Theorem 2.

The formula of arc radius by using straight diameter:

Proof.

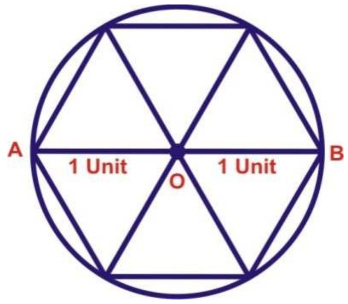


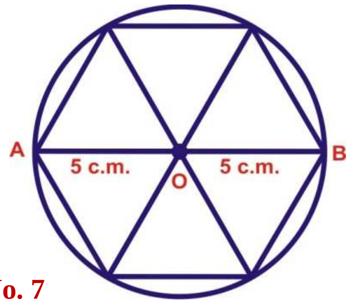
Diagram No.6

Straight Diameter = 2 Unit
Circumference of circle = $d_s\ominus$
= 2 Unit x 3.141592653 = 6.283185306 Unit

Formula of Arc Radius : $d_s\ominus \div 6$ = Straight diameter x Goba ÷ 6

Arc radius = $d_s\ominus \div 6$
= 2 *Unit* x 3.141592653 ÷ 6
= 6.283185306 Unit Circumference of circle ÷ 6 = 1.047197551 *Unit* Arc radius

Example 3.



For example we consider straight diameter = 10 c.m.
Circumference of circle = $d_s\ominus$
= 10 c.m. x 3.141592653
= 31.41592653 c.m. Circumference of circle

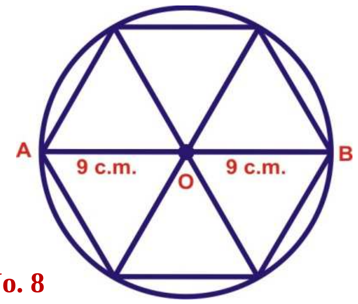
Formula of Arc Radius : $d_s\ominus \div 6$ = Straight diameter x Goba ÷ 6

Arc radius = $d_s\ominus \div 6$
= 10 c.m. x 3.141592653 ÷ 6

Diagram No. 7

= 31.41592653 c.m Circumference of circle ÷ 6 = 5.235987755 c.m. Arc radius

Example 4.



For example we consider straight diameter = 18 c.m.
Circumference of circle = $d_s\ominus$
= 18 c.m. x 3.141592653
= 56.548667754 c.m. Circumference of circle

Formula of Arc Radius : $d_s\ominus \div 6$ = Straight diameter x Goba ÷ 6

Arc radius = $d_s\ominus \div 6$
= 18 c.m. x 3.141592653 ÷ 6

Diagram No. 8

= 56.548667754 c.m Circumference of circle ÷ 6 = 9.424777959 c.m. Arc radius

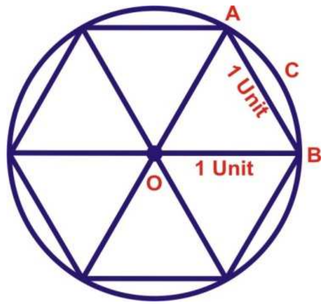
Exercise : 2

(i). Find arc diameter whose straight diameter is 7 c.m.
(Ans: 3.6651914285).
(ii). Find arc diameter whose straight diameter is 19 metre.
(Ans: 9.9483767345).

Theorem 3.

The formula of arc radius by using 1.047197551 Su. S. J. Constant:

Proof.



Straight Radius = 1 *Unit*

Diagram No.3

Formula of Arc Radius : Straight Radius *Unit* x 1.047197551 Su.S.J. Constant = Arc radius *Unit*

1 *Unit* x 1.047197551 Su.S.J. Constant = 1.047197551 *Unit* Arc radius

Example 5.

For example we consider straight radius = 5 c.m.

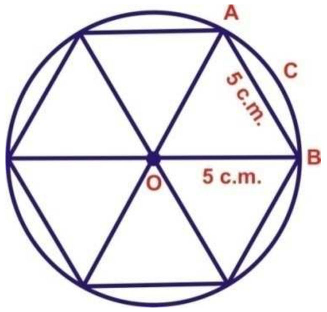


Diagram No.4

Formula of Arc Radius : Straight Radius *Unit* x 1.047197551 Su.S.J. Constant = Arc radius *Unit*

Arc radius = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant = 5.235987755 c.m. Arc radius
Arc radius ℓ (A C B) = 5.235987755 c.m.

Example 6.

For example we consider straight radius = 9 c.m.

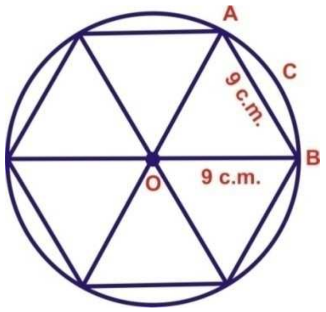


Diagram No.5

Formula of Arc Radius : Straight Radius *Unit* x 1.047197551 Su.S.J. Constant = Arc radius *Unit*

Arc radius = Straight Radius 9 c.m. x 1.047197551 Su.S.J. Constant = 9.424777959 c.m. Arc radius
Arc radius ℓ (A C B) = 9.424777959 c.m.

Exercise : 3

(i). Find arc radius whose straight radius is 14 c.m.
(Ans: 14.660765714).
(ii). Find arc radius whose straight radius is 16 metre.
(Ans: 16.755160816).

Verification of, how the new formula of Arc radius is correct:

$\ominus$ = Goba means Circumference of circle ÷ Straight diameter = Goba,
6.283185306 ÷ 2 = 3.141592653 Goba Constant

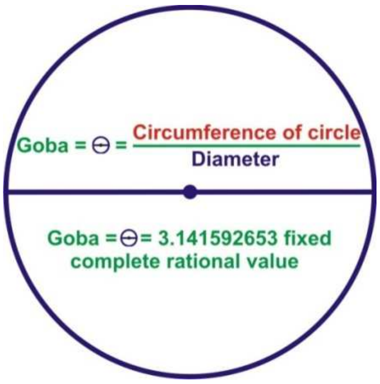


Diagram No.9

Ratio of arc radius to straight radius

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{1047197551^0}{1000000000^0} = \frac{1.047197551^0}{1^0} =$$

$$= 1.047197551\ Su.\ S.\ J.\ Constant\ means$$

$$Sulabha\ Shantaram\ Janorkar$$

Ratio

Radius 1^0 : 1.047197551^0 Arc Radius
Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 = 6.283185306^0 Circumference of circle
Diameter = 2 Radius = 1^0 x 2 = 2^0 Radius

Example 7.

For example we consider straight radius = 5 c.m.

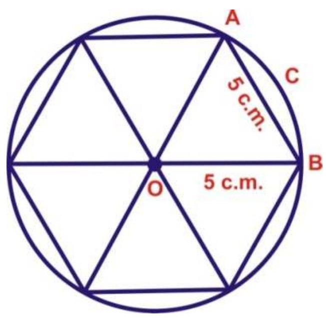


Diagram No.10

Circumference of circle = $2\ominus r_s$
= 2 x 3.141592653 x 5 c.m.
= 31.41592653 c.m. Circumference of circle ………… (1)

Straight Radius = 5 c.m.
Arc radius = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant = 5.235987755 c.m. Arc radius
Arc radius ℓ (A C B) = 5.235987755 c.m.

OR

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 5\ c.\ m.}{6} = 5.235987755\ c.\ m.\ Arc\ Radius$$

OR

Arc radius = $d_s \ominus \div 6$
= 10 c.m. x 3.141592653 ÷ 6
= 31.41592653 c.m Circumference of circle ÷ 6 = 5.235987755 c.m. Arc radius

Circumference of circle = 6 Arc radius = 6 x Arc radius ℓ (A C B)
= 6 x 5.235987755 c.m.
= 31.41592653 c.m. Circumference of circle ………… (2)

From, equation (1) & (2) they are equal, therefore the formula of Arc radius is correct.

Example 8.

For example we consider straight radius = 9 c.m.

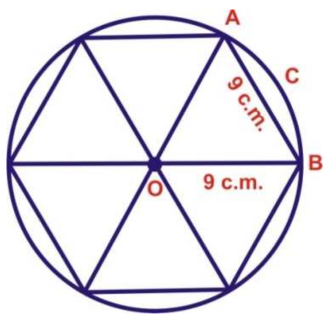


Diagram No.11

Circumference of circle = $2\ominus r_s$
= 2 x 3.141592653 x 9 c.m.

= 56.548667754 c.m. Circumference of circle ………… (1)

Straight Radius = 9 c.m.

Arc radius = Straight Radius 9 c.m. x 1.047197551 Su.S.J. Constant = 9.424777959 c.m. Arc radius

Arc radius ℓ (A C B) = 9.424777959 c.m.

OR

Arc radius = 2 $\ominus$ r_s ÷ 6

$$= \frac{2 \times 3.141592653 \times 9 \ c.\ m.}{6} = 9.424777959 \ c.\ m.\ Arc\ Radius$$

OR

Arc radius = d_s $\ominus$ ÷ 6

= 18 c.m. x 3.141592653 ÷ 6

= 56.548667754 c.m Circumference of circle ÷ 6 = 9.424777959 c.m. Arc radius

Circumference of circle = 6 Arc radius = 6 x Arc radius ℓ (A C B)

= 6 x 9.424777959 c.m.

= 56.548667754 c.m. Circumference of circle ………… (2)

From, equation (1) & (2) they are equal, therefore the formula of Arc radius

Chapter (Unit) … V

Arc Radius: Part - 5

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ ,
Goba = 3.141592653

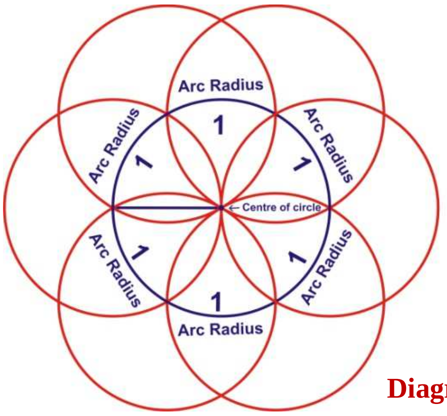


Diagram No.1

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Theorem 1.

As per the Measure of two equilateral triangle, Measure of circle and Measure of circumference of circle

Proof.

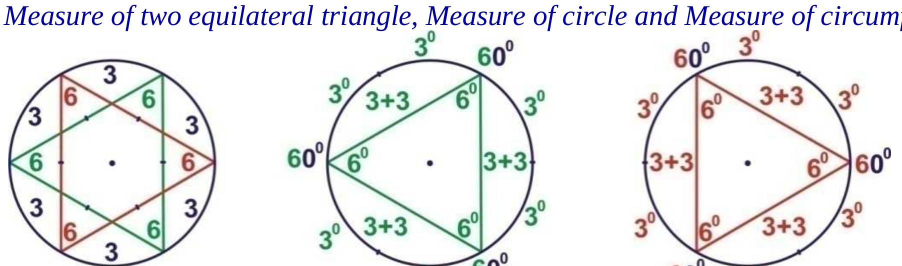


Diagram No.3

The measure of 2 arc radius opposite of the angle as per original 3^0

Measure of triangle:

Measure of three angles = $6^0 + 6^0 + 6^0 = 18^0$

Measure of three angles = $6^0 + 6^0 + 6^0 = 18^0$

Measure of circle = 2 (Measure of equilateral triangle)

= $18^0 + 18^0 = 36^0$ Measure of circle

= $\ominus + \ominus = 2\ominus$ Goba

Measure of circle = $2\ominus = 18^0 \times 2^0 = 36^0$

Measure of circumference of circle = As per Measure of 2 equilateral triangles, Measure of 2 equilateral triangles.

= As per measure of circle, Measure of angle x Measure of circumference

= $6^0 \times 10^0 = 60^0$ Measure of angle

= $60^0 + 60^0 + 60^0 = 180^0$

= $60^0 + 60^0 + 60^0 = 180^0$

$\ominus^c$ = Goba Radian

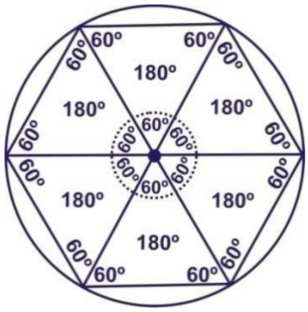
Measurå of circumference of circle = $2\ominus^c = 180^0 \times 2^0 = 360^0$

Theorem 2.
The triangle is in 180^0.

Proof.
Measure of circumference of circle = Around the centre point, arise the 6 parts of angle and one part is of 60^0 measure of angle.

∴ How many measure of 6 parts?
60^0 **x** 6 parts = 360^0
Circumference of circle is divided in to 6 equilateral triangles therefore one arc radius is in 6^0.

Diagram No.4



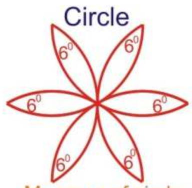
Circumference of a circle is divides in six (6) parts, which means the circumference of a circle contains six (6) equilateral triangles.

Theorem 3.

***Circle and Measure of circle*:-** Explanation via diagram is as follows

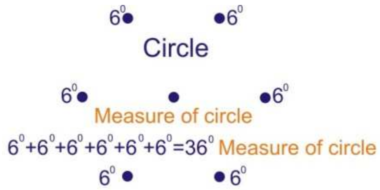
Proof.

Diagram No.5



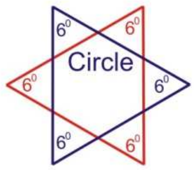
Measure of circle
$6^0+6^0+6^0+6^0+6^0+6^0=36^0$
Measure of circle

Diagram No.6



- One angle of triangle is equal to opposite of two arc radius. = Measure of angle = 3°x 2 = 6°
- Original circumference of circle is into 6 arc radius.

Diagram No.7



Measure of circle =
2(Measure of equilateral triangle)
= (6°+ 6°+ 6°) + (6°+ 6°+ 6°)
= 18° + 18° = 36°Measure of circle

$6^0 + 6^0 + 6^0 + 6^0 + 6^0 + 6^0 = 36^0$ Measure of circle
$60^0 + 60^0 + 60^0 + 60^0 + 60^0 + 60^0 = 360^0$ Measure of circumference of circle
Formula: Measure of circle x Measure of Circumference = Measure of circumference of circle
36^0 x 10^0 = 360^0 Measure of circumference of circle

Chapter (Unit) … VI

Arc Radius: Part - 6

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Length = ℓ , Goba = 3.141592653

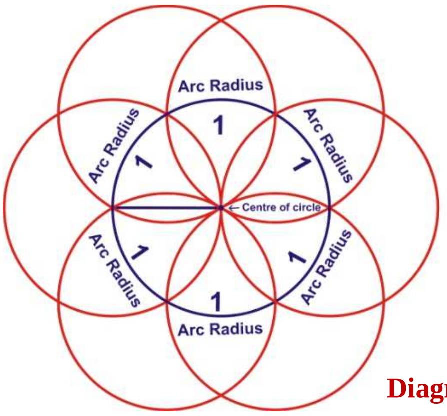


Diagram No.1

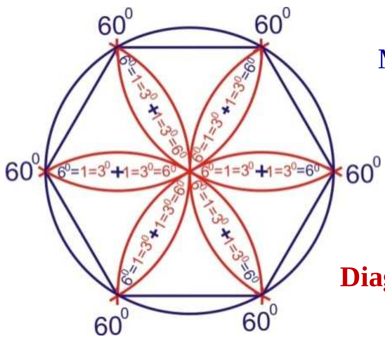
On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.2

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Aliter: 1



Measure of circle 3^0 as per measure of original arc radius

= 12 arc radius x 3^0 = 360^0

= 36^0 Measure of circle

Measure of circumference of circle = 60^0 **x** 6^0 = 360^0

Diagram No.3

Aliter: 2

As per measure of circle:

6^0 • • 6^0

Circle

6^0 • • • 6^0

$6^0+6^0+6^0+6^0+6^0+6^0=36^0$

6^0 • • 6^0

Diagram No.4

$$\ominus = \text{Goba} = \frac{\text{Circle } (6^0+6^0+6^0+6^0+6^0+6^0=36^0)}{2} = \frac{36^0}{2} = 18^0 \ominus \text{Goba}$$

(36^0 Measure of circle)

Measure of circle = $2\ominus$ = 2 x 18^0 = 36^0

As per measure of circumference of Circle:

$\ominus^c$ = Goba Radians

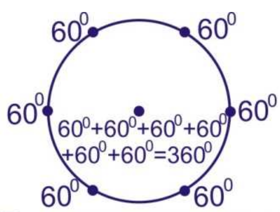


Diagram No.5

$$\ominus^c = \text{Goba Radian} = \frac{60^0+60^0+60^0+60^0+60^0+60^0=360^0}{2} = \frac{360^0}{2} = 180^0 \ominus^c \text{Goba Radian}$$

(360^0 Measure of circumference of Circle)

Measure of circumference of Circle = $2\ominus^c$ = 2 x 180^0 = 360^0

Aliter: 3

36^0 Measure of circle is the original base of Goba Mathematics. 36^0 Measure of circle is explained and proved by different methods on the back pages.

Arc Radius 6^0 according to measure of circle and Arc Radius 60^0 according to measure of circumference of circle.

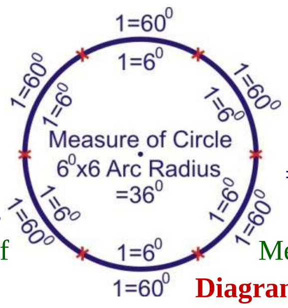
Explanation via diagram:-

Note:

1 digit shows arc radius.

6^0 digit shows measure of arc radius according to measure of circle.

60^0 Number shows measure of arc radius according to measure of circumference of circle.



Measure of circumference of circle $= 60^0$ x 6 Arc radius $= 360^0$

Measure of circle $= 36^0$

Measure of circumference of circle $= 360^0$

Diagram No. 6

Aliter: 4

Measure of circle and Measure of circumference of circle : As per Measure of equilateral triangle

Diagram No.7

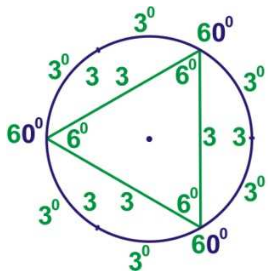


Diagram No.8

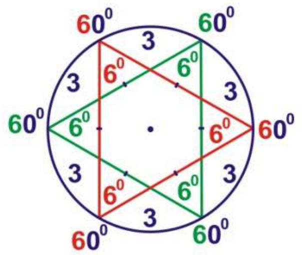
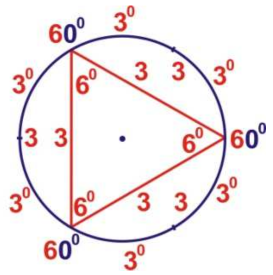


Diagram No.9



Measure of circle = Measure of equilateral triangle + Measure of equilateral triangle

$= 6^0 + 6^0 + 6^0 = 18^0 + 6^0 + 6^0 + 6^0 = 18^0$

$= 18^0 + 18^0 = 36^0$ Measure of circle = 2 Equilateral triangle

Measure of circumference of circle = Measure of equilateral triangle + Measure of equilateral triangle

$= 60^0 + 60^0 + 60^0 = 180^0 + 60^0 + 60^0 + 60^0 = 180^0$

$= 180^0 + 180^0 = 360^0$ Measure of circumference of circle

Formula: Measure of circle **x** Measure of circumference = Measure of circumference of circle

36^0 **x** 10^0 $= 360^0$ Measure of circumference of circle

Aliter: 5

As per Measure of circle and Measure of circumference of circle

Measure of circle:

$6^0 + 6^0 + 6^0 + 6^0 + 6^0 + 6^0 = 36^0$

Measure of circumference of circle :

$60^0 + 60^0 + 60^0 + 60^0 + 60^0 + 60^0 = 360^0$

Goba Radians $= \ominus^c = \dfrac{360^0}{2} = 180^0$

Goba $= \ominus = \dfrac{36^0}{2} = 18^0$

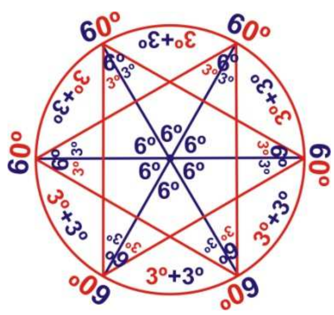


Diagram No. 10

Measure of centre of circle = 6 Arc radius has 1 Measure of centre of circle

Chapter (Unit) … VII

Goba Verification and Its Applications

INTRODUCTION:

This is a fundamental research, in mathematics (Geometry) is a new concept created. Which, Dhananjay Shantaram Janorkar is putting in the form of book before the World. In the research paper titled *"The self - proving theorem of Goba and its explanation on the basis of a formula (Goba Cha Swayamshidha Sidhanta Wa Sutrachya Aadharache Spastikaran, (In marathi)],"* Published in, International Journal of Shantaram Janorkar Foundation of Mathematics, Science & Spiritual, Edition–1, 15 September, 2015, Page No. 81-156, (In english), Aawaruti -1 (Edition-1), 15 September, 2015, Pan Number 157-226, (In marathi), ISO 9001:2008, ISSN (P):2454-5236, ISSN (O):2454-633X, ISBN: 978-81-930845-0-2, which is researched by Late Shri Shantaram Bapurao Janorkar and compiled by Dhananjay Shantaram Janorkar with providing diffetent examples and putting them in scientific and mathematical language, circumference of circle 6283185306º ÷ diameter 2000000000º = Goba 3.141592653 the constant of Goba is definite, complete and rational. While thinking over this research paper prepared by Dhananjay Shantaram Janorkar getting new concepts through this research and that inspires the author to do research and prepare research papers on different new subjects. From this, various new formulae in mathematics (Geometry) have come to notice. The theorem of various formulae of equations in mathematics (Geometry), [Ganit (Bhumiti) Madhil Veg Vegalya Samikarnanchya Sutranchaa Shidhanta, (In Marathi)], International Journal of Shantaram Janorkar Foundation of Mathematics, Science & Spiritual, Edition–2, Volume - 2, Issue - 2, 15 September, 2016, Page No. 467-482, (In english), Aawaruti -2, (Edition-2), Volume - 2, Issue - 2, 15 September, 2016, Pan Number 483-500, (In marathi), ISO 9001:2008, ISSN (P):2454-5236, ISSN (O):2454-633X, ISBN: 978-81-930845-1-9, And author and researcher Dhananjay Shantaram Janorkar is putting this formulae before the world and he has tried to explain clearly this formula in scientific and mathematical language by giving different examples in this, *"Arc Radius, Goba Verification and Its Applications"*, book.

Moreover, to establish this research scientifically, renowned mathematician, Honorable Prof. Dr. T. M. Karade, Prof. Dr. Shriram B. Patil, Prof. Dr.B.S. Rajput, Prof. Dr. M. T. Teli, Prof. Dr. Kamel Lahmar (Algeria), AFRICA, Prof. Dr. Kishor S. Adhav, Prof. Dr.J.N. Salunke, Prof. Dr. S. D. Katore, Prof. Dr. M. B. Dhakne and Prof. Dr. D. T. Solanke gave the guidance to author and still they are doing so from time to time for which Dhananjay Shantaram Janorkar has greatful to them.

The circumference of circle 6283185306^0 ÷ diameter 2000000000^0 = Goba 3.141592653 the constant of Goba is definite, complete and rational. From the expression 'circumference of a circle divided by diameter,' you will get definite, complete rational answers. The different formulae for equations in mathematics (geometry) follow as:
($\ominus$ = Goba means circumference of circle ÷ straight diameter = Goba, $6.283185306^0 \div 2^0 = 3.141592653$)
In the research paper 'The self - proving theorem of Goba and its explanation on the basis of a formula [Goba Cha Swayamshidha Sidhanta Wa Sutrachya Aadharache Spastikaran, (In marathi)]', the constant no. 6 = 1.047197551 is Su.S.J. Constant, Su. S. J. Means Sulabha Shantaram Janorkar

Straight Radius = r_s , Arc Radius = r_a , Straight Diameter = d_s , Arc Diameter = d_a , Area = A , Volume = v , Length = ℓ , Goba = 3.141592653

1) Goba = $\ominus$:

$$\frac{Circumference\ of\ circle}{Straight\ Diameter} = Goba$$

$$Goba = \ominus = \frac{6283185306}{2000000000} = \frac{6.283185306}{2} = 3.141592653$$

= 3.141592653 Goba Constant

$\ominus$ = Goba means Circumference of circle ÷ Straight diameter = Goba,
6.283185306 ÷ 2 = 3.141592653 Goba Constant

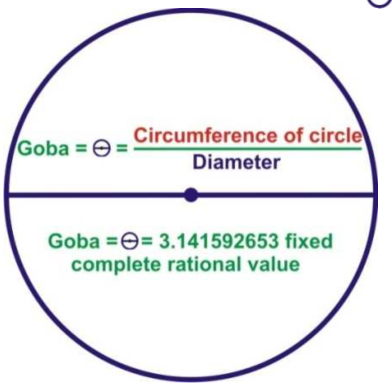


Diagram No.1

Ratio of arc radius to straight radius

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{1047197551^0}{1000000000^0} = \frac{1.047197551^0}{1^0} =$$

$= 1.047197551\ Su.\ S.\ J.\ Constant$

Ratio

Radius 1^0 : 1.047197551^0 Arc Radius

Circumference of circle = 6 Arc Radius = 6 x 1.047197551^0 = 6.283185306^0 Circumference of circle

Diameter = 2 Radius = 1^0 x 2 = 2^0 Radius

If any measure of arc radius of circumference of circle is divided by the same straight radius of the same circumference of circle the resultant is 1.047197551 Su. S. J. constant.

1.047197551 Su.S.J.constant x6 Arc radius = 6.283185306^0 the value of circumference of circle.

The value of circumference of circle 6.283185306^0 ÷ 2^0 straight radius = 3.141592653 we get the value of Goba.

For example:

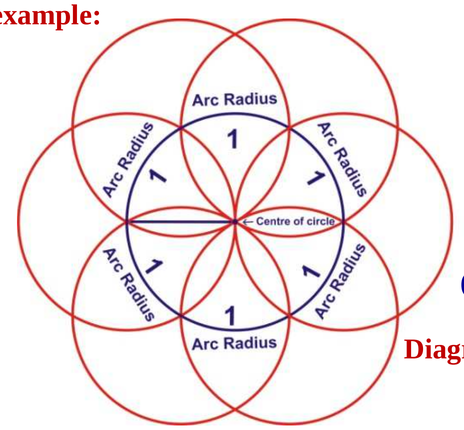


Diagram No.2

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.3

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Straight Radius = 5 c.m.

Circumference of circle = $2\ominus r_s$

= 2 x 3.141592653 x 5 c.m.

= 31.41592653 c.m. Circumference of circle

Straight Radius = 5 c.m.

Arc radius = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant = 5.235987755 c.m. Arc radius

Arc radius ℓ (A C B) = 5.235987755 c.m.

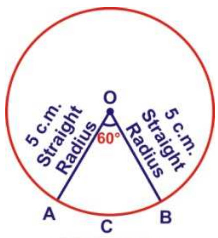


Diagram No.4

OR

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 5\ c.m.}{6} = 5.235987755\ c.m.\ Arc\ Radius$$

OR

Straight diameter = 10 c.m.

Arc radius = $d_s \ominus \div 6$

= 10 c.m. x 3.141592653 ÷ 6

= 31.41592653 c.m Circumference of circle ÷ 6 = 5.235987755 c.m. Arc radius

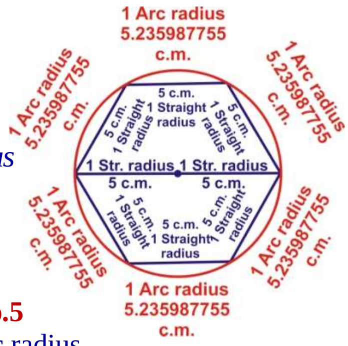


Diagram No.5

Straight Radius = 5 c.m., Arc Radius = 5.235987755 c.m.

$$\frac{Arc\ Radius}{Straight\ Radius} = \frac{5.235987755\ c.m.}{5\ c.m.} = 1.047197551\ Su.\ S.\ J.\ Constant$$

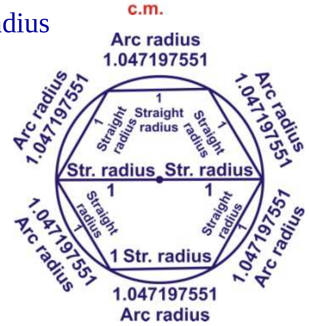


Diagram No.6

Formula of Goba = $\ominus = \frac{Circumference\ of\ circle}{Diameter} = \frac{Circumference\ of\ circle}{Straight\ Diameter} = \frac{6\ Arc\ Radius}{2\ Straight\ Radius} =$

$$= \frac{6 \times 1.047197551^0}{2^0} = \frac{6.283185306^0}{2^0} = 3.141592653\ Constant\ of\ Goba$$

2) Circumference of circle:

a) Circumference of circle = $2\ominus r_s$

For example:

Straight Radius = 5 c.m.

Circumference of circle = $2\ominus r_s$

= 2 x 3.141592653 x 5 c.m.

= 31.41592653 c.m. Circumference of circle

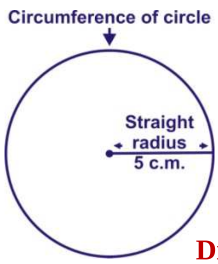


Diagram No.7

b) Circumference of circle = $\ominus d_s$

For example:

Straight Diameter = 2 x Straight Radius

Straight Radius = 5 c.m.

Straight Diameter = 5 c.m. x 2 = 10 c.m.

Circumference of circle = $\ominus d_s$

= 3.141592653 x 10 c.m.

= 31.41592653 c.m. Circumference of circle

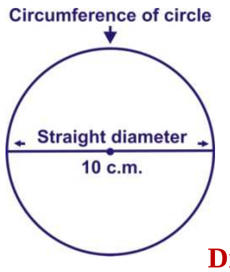


Diagram No.8

c) Circumference of circle = 6 Arc radius = 6 x Arc radius

For example:

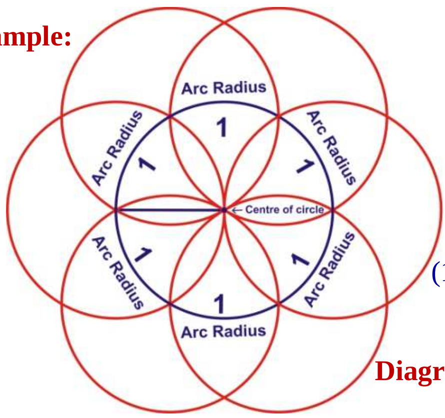


Diagram No.9

On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.


Diagram No.10

(1 Circumference of circle is to be made from 6 Arc radius)

Circumference of circle = 6 Arc radius

Straight Radius = 5 c.m.
Arc radius = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant = 5.235987755 c.m. Arc radius
Arc radius ℓ (A C B) = 5.235987755 c.m.

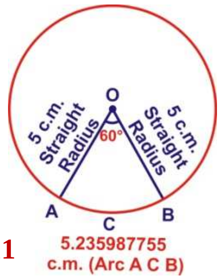


Diagram No.11

OR

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 5 \; c.\,m.}{6} = 5.235987755 \; c.\,m. \; Arc \; Radius$$

OR

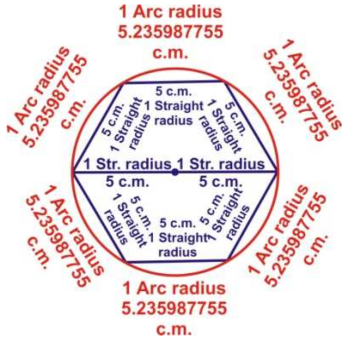


Diagram No.12

Arc radius = $d_s \ominus \div 6$
= 10 c.m. x 3.141592653 ÷ 6
= 31.41592653 c.m Circumference of circle ÷ 6 = 5.235987755 c.m. Arc radius

Circumference of circle = 6 Arc radius = 6 x Arc radius ℓ (A C B)
= 6 x 5.235987755 c.m.
= 31.41592653 c.m. Circumference of circle

3) Area of circle:

a) Area of circle = $\ominus r_s^2$

For example:

Straight Radius = 5 c.m.

Area of circle = $\ominus r_s^2$
= 3.141592653 x (5 c.m.)^2
= 3.141592653 x 25 c.m.
= 78.539816325 c.m. Area of circle

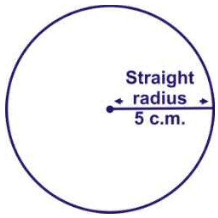


Diagram No.13

b) Area of circle = $\ominus d_s^2 / 4$

For example:

Straight Diameter = 2 x Straight Radius
Straight Radius = 5 c.m.
Straight Diameter = 5 c.m. x 2 = 10 c.m.

Area of circle = $\ominus d_s^2 / 4$
= 3.141592653 x (10 c.m.)^2 ÷ 4
= 3.141592653 x 100 c.m. ÷ 4
= 78.539816325 c.m. Area of circle

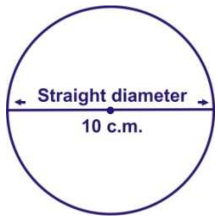


Diagram No.14

4) Area of Sector:

$$= \frac{1}{2} \times Arc\;ACB \times r_s = \frac{\ominus \; r_s^2 \theta}{360} \quad = \frac{\theta}{360} \times \ominus r_s^2 \quad = \frac{1}{2} \; r_s^2 \theta \; radians$$

$$\theta = 60^0 = 60^0 \times \frac{\ominus^C}{180^0} = \frac{60 \times 3.141592653^C}{180}$$

$\theta = 1.047197551^C$ or
1.047197551 radians

$\ell = r_s\theta$

$= 5$ c.m. x 1.047197551 radians

ℓ (Arc ACB) = 5.235987755 c.m.

For example:

a) Area of Sector $= \frac{1}{2} \times Arc\ ACB\ \ or\ length\ of\ \ arc \times r_s$

= 0.5 x 5.235987755 (c.m.)² x 5 c.m.

= 13.0899693875 c.m.²

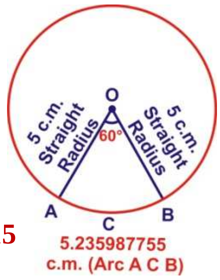


Diagram No.15

b) Area of Sector $= \frac{\ominus r_s^2 \theta}{360}$

$= \frac{3.141592653 \times 5 c.m.^2 \times 60^0}{360^0}$

$= \frac{3.141592653 \times 25\ (c.m.)^2 \times 60^0}{360^0}$

$= \frac{4712.3889795}{360^0}$

= 13.0899693875 c.m.²

c) Area of Sector $= \frac{\theta}{360} \times \ominus r_s^2$

$= \frac{60^0}{360^0} \times 3.141592653 \times 5 c.m.^2$

$= \frac{60^0}{360^0} \times 3.141592653 \times 25\ (c.m.)^2$

$= \frac{60^0 \times 3.141592653 \times 25\ (c.m.)^2}{360^0}$

$= \frac{4712.3889795}{360^0}$

= 13.0899693875 c.m.²

d) Area of Sector $= \frac{1}{2}\ r_s^2 \theta\ radians$

= 0.5 x 5 c.m.² x θ radians

= 0.5 x 25 (c.m.)² x 1.047197551 radians

= 13.0899693875 c.m.²

5) Straight radius:

a) Straight radius = Arc Radius ÷ 1.047197551 Su.S.J. Constant

For example:

Arc Radius = 5.235987755 c.m.

Straight radius = Arc Radius ÷ 1.047197551 Su.S.J. Constant

Straight radius = Arc Radius 5.235987755c.m. ÷ 1.047197551 Su.S.J. Constant

= 5 c.m. Straight radius

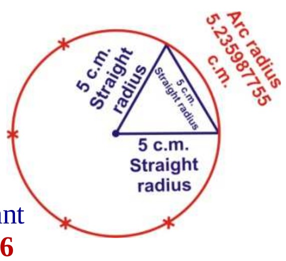


Diagram No.16

b) Straight radius = Circumference of circle ÷ $2\ominus$

For example:

Circumference of circle = 31.41592653 c.m.

Straight radius = Circumference of circle ÷ $2\ominus$

= 31.41592653 c.m. ÷ 2 x 3.141592653

= 31.41592653 c.m. ÷ 6.283185306

= 5 c.m. Straight radius

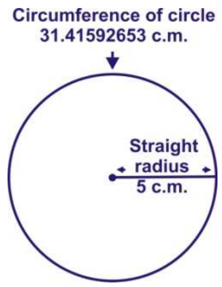


Diagram No.17

6) Arc radius:

a) Arc radius = Straight Radius x 1.047197551 Su.S.J. Constant

For example:

Straight Radius = 5 c.m.

Arc radius = Straight Radius x 1.047197551 Su.S.J. Constant

Arc radius = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant

= 5.235987755 c.m. Arc radius

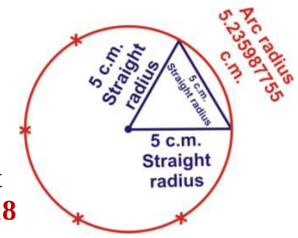
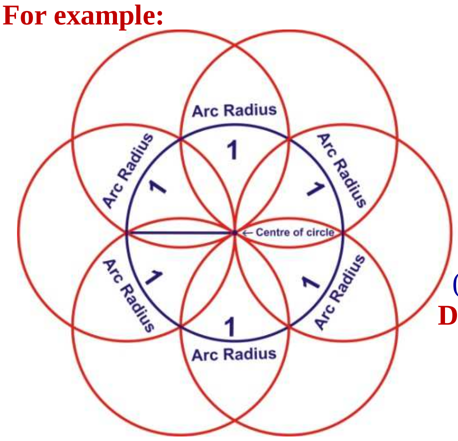


Diagram No.18

b) Arc radius = $2\ominus r_s \div 6$

For example:



On the original circumference of circle there are six circumference of circle of first construction. Original circumference of circle is divided in to six arc radius by this six circumference of circle.

Diagram No.20

(1 Circumference of circle is to be made from 6 Arc radius)

Diagram No.19 Circumference of circle = 6 Arc radius

Arc radius = $2\ominus r_s \div 6$

$$= \frac{2 \times 3.141592653 \times 5\ c.m.}{6}$$

$$= 5.235987755\ c.m.\ Arc\ Radius$$

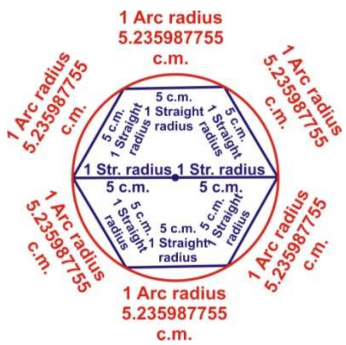


Diagram No.21

c) Arc radius = $d_s\ominus \div 6$

For example:

Arc radius = $d_s\ominus \div 6$

= 10 c.m. x 3.141592653 ÷ 6

= 31.41592653 c.m Circumference of circle ÷ 6

= 5.235987755 c.m. Arc radius

7) Straight Diameter:

a) Straight diameter = Arc Radius ÷ 1.047197551 Su.S.J. Constant x 2

For example:

Arc Radius = 5.235987755 c.m.

Straight diameter = Arc Radius ÷ 1.047197551 Su.S.J. Constant x 2

Straight diameter = Arc Radius 5.235987755 c.m. ÷ 1.047197551 Su.S.J. Constant x 2

= 10 c.m. Straight diameter

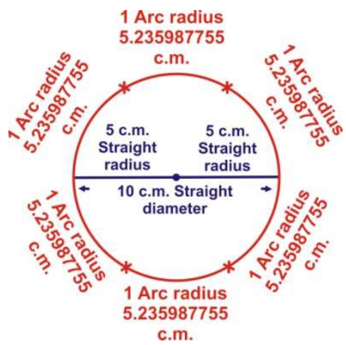
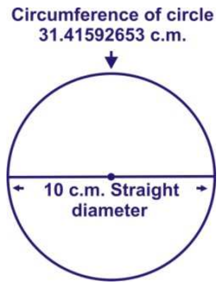


Diagram No.22

b) Straight diameter = Circumference of circle ÷ $\ominus$

For example:



Circumference of circle = 31.41592653 c.m.

Straight diameter = Circumference of circle ÷ $\ominus$

= 31.41592653 c.m. ÷ 3.141592653

= 10 c.m. Straight diameter

Diagram No.23

8) Arc Diameter:

a) Arc diameter = Straight Radius x 1.047197551 Su.S.J. Constant x 2

For example:

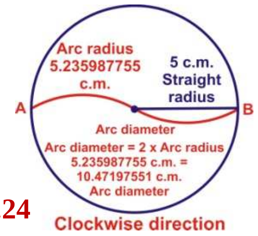


Diagram No.24

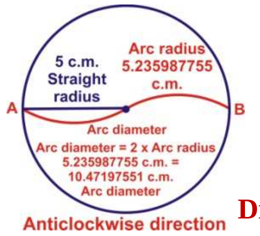


Diagram No.25

Straight Radius = 5 c.m.

Arc diameter = Straight Radius x 1.047197551 Su.S.J. Constant x 2

Arc diameter = Straight Radius 5 c.m. x 1.047197551 Su.S.J. Constant x 2

= 10.47197551 c.m. Arc diameter

9) Formula of the Volume of the sphere (cubic units):

i) Formula of the Volume of the sphere $= \frac{4}{3} \ominus r_s^3$

$= \frac{4}{3} \times \ominus \times r_s^3$, $= \frac{4}{3}$ x Goba x Straight Radius^3

For example:

Straight Radius = 5 c.m., (The Volume of the sphere, by taking 5 c.m. Straight Radius)

$\frac{4}{3}$ X 3.141592653 X (5 c.m.)^3

$\frac{4 \text{ X } 3.141592653}{3}$ X 125 c.m.^{3}

$\frac{12.566370612}{3}$ X 125 c.m.^{3}

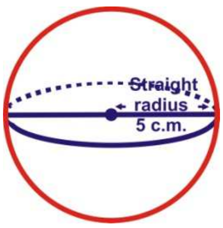


Diagram No.26

4.188790204 X 125 c.m.^{3} = 523.5987755 c.m.^{3}

The Volume of the sphere = 523.5987755 c.m.^{3}

ii) Formula of the Surface Area of a Sphere (sq. units):

Surface Area of a Sphere $= 4 \ominus r_s^2$

$= 4 \times \ominus \times r_s^2$, = 4 x Goba x Straight Radius^2

For example:

Straight Radius = 5 c.m., (The Surface Area of a Sphere, by taking 5 c.m. Straight Radius)

= 4 X 3.141592653 X (5 c.m.)^2

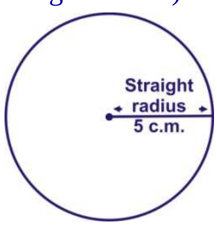
= 4 X 3.141592653 X 25 c.m.^{2}

= 12.566370612 X 25 c.m.^{2}

= 314.1592653 c.m.^{2}, Surface Area of a Sphere

The Surface Area of a Sphere = 314.1592653 c.m.^{2}

Diagram No.27



10) Formula of the Volume of the hemisphere (cubic units):

i) Formula of the Volume of the hemisphere $= \frac{2}{3} \ominus r_s^3$

$= \frac{2}{3}$ **x** $\ominus$ **x** $\mathbf{r_s^3}$, $= \frac{2}{3}$ x Goba x Straight Radius^3

For example:

Straight Radius = 5 c.m., (The Volume of the hemisphere, by taking 5 c.m. Straight Radius)

$\frac{2}{3}$ X 3.141592653 X (5 c.m.)^3

$\frac{2 \text{ X } 3.141592653}{3}$ X 125 c.m.^{3}

$\frac{6.283185306}{3}$ X 125 c.m.^{3}

2.094395102 X 125 c.m.^{3} = 261.79938775 c.m.^{3}

The Volume of the hemisphere = 261.79938775 c.m.^{3}

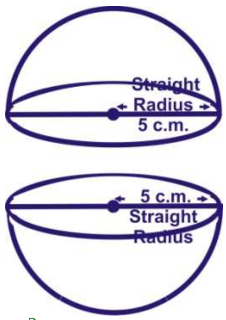


Diagram No.28

ii) Formula of the Total Surface Area of a Hemisphere (sq. units):

Total Surface Area of a Hemisphere $= 3 \ominus r_s^2$

= 3 x $\ominus$ x r_s^2 , = 3 x Goba x Straight Radius^2

For example:

Straight Radius = 5 c.m., (The total surface area of a hemisphere, by taking 5 c.m. Straight Radius)

= 3 X 3.141592653 X (5 c.m.)^2

= 3 X 3.141592653 X 25 c.m.^{2}

= 9.424777959 X 25 c.m.^{2} = 235.619448975 c.m.^{2}

The total surface area of a hemisphere = 235.619448975 c.m.^{2}

iii) Formula of the Curved Surface Area of a Hemisphere (sq. units):

Curved Surface Area of a Hemisphere $= 2 \ominus r_s^2$

= 2 x $\ominus$ x r_s^2 , = 2 x Goba x Straight Radius^2

For example:

Straight Radius = 5 c.m., (The curved surface area of a hemisphere, by taking 5 c.m. Straight Radius)

= 2 X 3.141592653 X (5 c.m.)^2

= 2 X 3.141592653 X 25 c.m.^{2}

= 6.283185306 X 25 c.m.^{2} = 157.07963265 c.m.^{2}

The curved surface area of a hemisphere = 157.07963265 c.m.^{2}

iv) Area of plane surface:

Area of plane surface $= \ominus r_s^2$

For example:

Straight Radius = 5 c.m.

Area of plane surface $= \ominus r_s^2$

= 3.141592653 x (5 c.m.)^2

= 3.141592653 x 25 c.m.^{2}

= 78.539816325 c.m.^{2}

11) Volume of Ellipsoid:

a) Volume of Ellipsoid = (4/3) $\ominus$ $r_{s1}\ r_{s2}\ r_{s3}$ = (4/3) *Goba* $r_{s1}\ r_{s2}\ r_{s3}$

For example:

Straight Radius = 5 c.m.

Volume of Ellipsoid = (4/3) $\ominus$ $r_{s1}\ r_{s2}\ r_{s3}$

= (4/3) *Goba* $r_{s1}\ r_{s2}\ r_{s3}$

= 1.33333 x 3.141592653 x 7 c.m. x 5 c.m. x 6 c.m.

= 879.645942834 c.m.^{3}

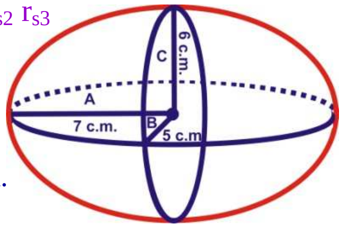


Diagram No.29

12) Formula of the Cube of the Straight radius:

r_s = Straight radius, v = Volume (Extent),

a) Formula of the Cube of the Straight radius (Formula of Straight radius^3 = r_s^3):-

$$r_s^{\,3} = \frac{v}{(4/3)\ominus} \quad , = r_s^{\,3} = \frac{3\times v}{4\times\ominus}$$

For example:

r_s^3, Cube of Straight radius (r_s^3 = Straight radius^3) = $\dfrac{3 \text{ X } 523.5987755 \text{ c.m.}^3}{4 \text{ X } 3.141592653}$

= $\dfrac{1{,}570.7963265 \text{ c.m.}^3}{12.566370612}$

Diagram No.30

= 125 c.m.^{3}, the Cube of the Straight radius

13) Cylinder:

i) The volume of a cylinder = Area of the base x height

V = $\ominus$ r_s^2 h = $\ominus$ r_s^2 x h

For example:

Volume of a cylinder = $\ominus$ r_s^2 x h = Goba × Straight radius^2 × Height

= 3.141592653 x (5 c.m.)^2 x 10 c.m.

= 3.141592653 x 25 c.m.^{2} x 10 c.m.

= 785.39816325 c.m.^{3}

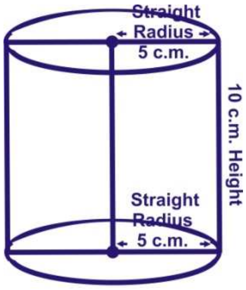


Diagram No.31

ii) Curved surface area of cylinder = Circumference of base x Height

= 2$\ominus$ r_s h = 2$\ominus$ r_s x h

For example:

Curved surface area of cylinder = 2$\ominus$ r_s x h = 2 x Goba x Straight radius x Height

= 2 x 3.141592653 x 5 c.m. x 10 c.m.

= 314.1592653 c.m.^{2}

iii) Total surface area of cylinder = 2$\ominus$ r_sh + 2$\ominus$ r_s^2 = 2$\ominus$ r_s (h + r_s) = 2$\ominus$ r_s (r_s + h)

= The curved surface area + area of two circles (bases)

For example:

Total surface area of cylinder =

= 2$\ominus$ r_sh + 2$\ominus$ r_s^2

= 2$\ominus$ r_s (h + r_s)

= 2$\ominus$ r_s (r_s + h)

Total surface area of cylinder = 2$\ominus$ r_sh + 2$\ominus$ r_s^2

= 2 x Goba x Straight radius x Height **+** 2 x Goba x Straight radius^2

= 2 x 3.141592653 x 5 c.m. x 10 c.m. **+** 2 x 3.141592653 x 5 c.m.^{2}

= 314.1592653 c.m.^{2} **+** 2 x 3.141592653 x 25 c.m.^{2}

= 314.1592653 c.m.² + 157.07963265 c.m.²
= 471.23889795 c.m.²

Total surface area of cylinder = $2\ominus r_s (h + r_s)$
= 2 x Goba x Straight radius (Height + Straight radius)
= 2 x 3.141592653 x 5 c.m. (10 c.m. + 5 c.m.)
= 31.41592653 c.m. (10 c.m. + 5 c.m.)
= 31.41592653 c.m. x 15 c.m.
= 471.23889795 c.m.²

Total surface area of cylinder = $2\ominus r_s (r_s + h)$
= 2 x Goba x Straight radius (Straight radius + Height)
= 2 x 3.141592653 x 5 c.m. (5 c.m. + 10 c.m.)
= 31.41592653 c.m. (5 c.m. + 10 c.m.)
= 31.41592653 c.m. x 15 c.m.
= 471.23889795 c.m.²

14) Cone:

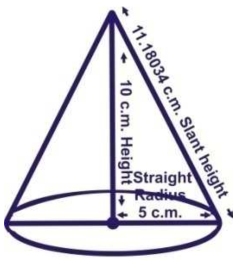
i) The Volume of a cone $= \frac{1}{3} \ominus r_s^2 h$, where r_s is the Straight radius of the base.

For example:

Volume of a cone $= \frac{1}{3} \ominus r_s^2 h$, $= \frac{1}{3} \times$ Goba $\times r_s^2 \times$ Height

i.e. circle of the cone and h its perpendicular height.

Volume of a cone $= \frac{1}{3} \ominus r_s^2 h$ **Diagram No.32**



$= \frac{1}{3}$ x 3.141592653 x 5 c.m.² x 10 c.m.
= 0.33333 x 3.141592653 x 25 (c.m.)² x 10 c.m.
= 261.7967697561225 (c.m.)³

ii) The curved surface area of cone = $\ominus r_s l$

Slant height of the cone = l $= \sqrt{h^2 + r_s^2}$

For example:

Slant height of the cone = l $= \sqrt{h^2 + r_s^2}$

$= \sqrt{10 c.m.^2 + 5 c.m.^2}$

$= \sqrt{100 c.m. + 25 c.m.}$

$l = \sqrt{125 (c.m.)^2} = 11.18034 c.m.$

Curved surface area of cone = $\ominus r_s l$
= 3.141592653 x 5 c.m. x 11.18034 c.m.
= 175.6203700102101 (c.m.)²

iii) The total surface area of cone = The area of base + the curved surface area of cone.
$= \ominus r_s^2 + \ominus r_s l$
$= \ominus r_s (r_s + l)$

For example:

Total surface area of cone = $\ominus r_s^2 + \ominus r_s l$
$= \ominus r_s (r_s + l)$

Total surface area of cone = $\ominus$ r_s^2 + $\ominus$ $r_s l$

= 3.141592653 x 5 c.m.² + 3.141592653 x 5 c.m. x 11.18034 c.m.

= 3.141592653 x 25 (c.m.)² + 3.141592653 x 5 c.m. x 11.18034 c.m.

= 78.539816325 (c.m.)² + 175.6203700102101(c.m.)²

= 254.1601863352101 (c.m.)²

Total surface area of cone = $\ominus$ r_s (r_s + l)

= 3.141592653 x 5 c.m. (5 c.m. + 11.18034 c.m.)

= 15.707963265 c.m. (5 c.m. + 11.18034 c.m.)

= 15.707963265 c.m. (16.18034 (c.m.)²)

= 15.707963265 c.m. x 16.18034 (c.m.)²

= 254.1601863352101 (c.m.)²

15) Frustum of the cone:

We use the glass (tumblers) for dranking water

If the cone is cut off by a plane parallel to the base not passing through the vertex, two parts are formed as

(i) Cone (a part towards the vertex)

(ii) Frustum of cone (the part left over on the other side i.e. towards base of the original cone).

Note: "Frustum" is a Latin word meaning piece cut off

Let 'h' be the height and 'l' be the slant height of the frustum of the cone and r_{s1} and r_{s2} the radii of the ends ($r_{s1} > r_{s2}$) or that frustum of the cone. (See fig. 32), we get the following formulae. Verify these formulae by using properties of similar triangles

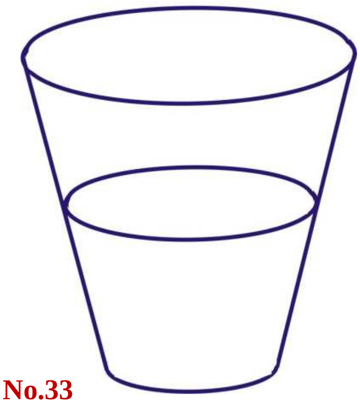


Diagram No.33

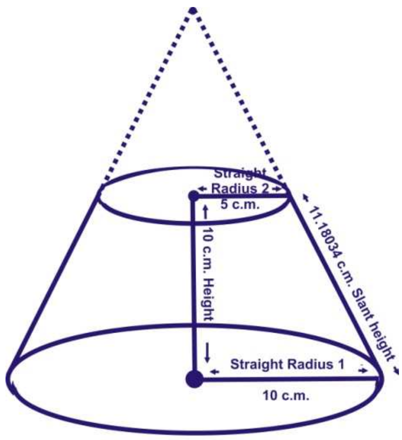


Diagram No.34

Slant height (l) of the frustum $= \sqrt{h^2 + (r_{s1} - r_{s2})^2}$

The curved surface area of the frustum $= \ominus\,(r_{s1} + r_{s2})l$

Total surface area of the frustum $= \ominus\,(r_{s1} + r_{s2})l + \ominus\,r_{s1}^2 + \ominus\,r_{s2}^2$

Volume of the frustum $= \frac{1}{3}\,\ominus\,(r_{s1}^2 + r_{s2}^2 + r_{s1} \times r_{s2})h$

For example:

i) Slant height (l) of the frustum $= \sqrt{h^2 + (r_{s1} - r_{s2})^2}$

$= \sqrt{10 c.m^2 + (10 c.m - 5 c.m)^2}$

$= \sqrt{100\ (c.m)^2 + 5 c.m^2}$

$= \sqrt{100\ (c.m)^2 + 25\ (c.m)^2}$

$= \sqrt{125\ (c.m)^2}$

= 11.18034 c.m.

ii) The curved surface area of the frustum = $\ominus$ $(r_{s1} + r_{s2})l$

= 3.141592653 (10 c.m. + 5 c.m.) 11.18034 c.m.
= 3.141592653 (15 (c.m.)^2) 11.18034 c.m.
= 3.141592653 x 15 (c.m.)^2 x 11.18034 c.m.
= 526.8611100306303 (c.m.)^2

iii) Total surface area of the frustum $= \ominus(r_{s1}+r_{s2})l + \ominus\, r_{s1}^2 + \ominus\, r_{s2}^2$

= 3.141595653 (10 c.m. + 5 c.m.) 11.18034 c.m. + 3.141592653 x 10 c.m.^{2} + 3.141592653 x 5 c.m.^{2}
= 3.141595653 (15 (c.m.)^2) 11.18034 c.m. + 3.141592653 x 100 (c.m.)^2 + 3.141592653 x 25 (c.m.)^2
= 3.141595653 x15 (c.m.)^2 x 11.18034 c.m.+ 3.141592653 x 100 (c.m.)^2 + 3.141592653 x 25 (c.m.)^2
= 1,325,085.29652540075 (c.m.)^2

iv) The Volume of the frustum $= \frac{1}{3}\ominus(r_{s1}^2 + r_{s2}^2 + r_{s1} \times r_{s2})h$

$= \frac{1}{3}$ x 3.141595653 (10 c.m.^{2} + 5 c.m.^{2} + 10 c.m. x 5 c.m.) 10 c.m.
= 0.333333333333333 x 3.141595653 (100 (c.m.)^2 + 25 (c.m.)^2 + 10 c.m. x 5 c.m.) 10 c.m.
= 0.333333333333333 x 3.141595653 (675 (c.m.)^2) 10 c.m.
= 0.333333333333333 x 3.141595653 x 675 (c.m.)^2 x 10 c.m.
= 7,068.58346924999325 (c.m.)^3

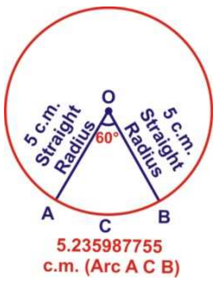
16) Length of the Arc:

$$l(Arc\ \ ACB) = \frac{\theta}{360} \times 2\ominus\, r_s = \frac{\theta \ominus\, r_s}{180}$$

θ = Degree
r_s = Straight radius

For example:

Diagram No.35



a) $l(Arc\ \ ACB) = \frac{\theta}{360} \times 2\ominus\, r_s$

$$= \frac{60^0}{360^0} \times 2 \times 3.141592653 \times 5c.m.$$

$$= \frac{60^0 \times 2 \times 3.141592653 \times 5c.m.}{360^0}$$

$$= \frac{1884.9555918c.m.}{360}$$

= 5.235987755 c.m.

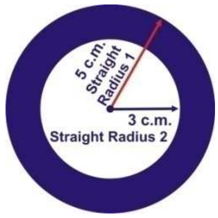
b) $l(Arc\ \ ACB) = \frac{\theta \ominus\, r_s}{180}$

$$= \frac{60^0 \times 3.141592653 \times 5c.m.}{180^0}$$

$$= \frac{942.4777959c.m.}{180}$$

= 5.235987755 c.m.

17) Area of shaded ring of a circle:



Area of shaded ring of a circle = $\ominus\left(r_{s1}^{\ 2} - r_{s2}^{\ 2}\right)$

For example:

Area of shaded ring of a circle = $\ominus\left(r_{s1}^{\ 2} - r_{s2}^{\ 2}\right)$

= $\ominus$ (5 c.m.^{2} – 3 c.m.^{2})
= 3.141592653 (25 (c.m.)^2 – 9 (c.m.)^2)
= 3.141592653 (16 (c.m.)^2)
= 3.141592653 x16 (c.m.)^2
= 50.265482448 (c.m.)^2

Diagram No.36

18) Length of a Circular Arc: (with central angle θ)
if the angle θ is in degrees, then length = θ x (GOBA/180°) x r_s
if the angle θ is in radians, then length = r_s x θ

For example:

a) If the angle θ is in degrees, then length = θ x (GOBA/180) x r_s
If the angle 60° is in degrees, then length = 60° x (3.141592653/180°) x 5 c.m.
= 60 x 0.01745329251666666666666666666667 x 5 c.m.
= 5.235987755c.m.

b) If the angle θ is in radians, then length = r_s x θ

$$\theta = 60^0 = \frac{60^0 \times \ominus^C}{180^0}$$

$$\theta = 60° = \frac{60 \times 3.141592653^C}{180}$$

θ = 1.047197551 radians

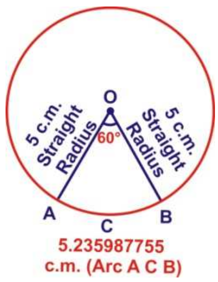


Diagram No.37

If the angle 1.047197551 is in radians, then length = 5 c.m. x 1.047197551 radians
= 5.235987755 c.m.

19) Area of Circle Sector: (with central angle θ)
if the angle θ is in degrees, then area = (θ /360°) x GOBA r_s^2
if the angle θ is in radians, then area = ((θ / (2 GOBA)) x GOBA r_s^2

For example:

a) If the angle θ is in degrees, then area = (θ /360°) x GOBA r_s^2
If the angle 60° is in degrees, then area = (60° /360°) x 3.141592653 x 5 c.m.^{2}
= 0.16666666666666666666666666666667 x 3.141592653 x 25 (c.m.)^2
= 13.0899693875 (c.m.)^2

b) If the angle θ is in radians, then area = ((θ / (2 GOBA)) x GOBA r_s^2

$$\theta = 60^0 = \frac{60^0 \times \ominus^C}{180^0}$$

$$\theta = 60° = \frac{60 \times 3.141592653^C}{180}$$

θ = 1.047197551 radians
If the angle 1.047197551 is in radians,
then area = ((1.047197551 / (2 x 3.141592653)) x 3.141592653 x 5 c.m.^{2}
= (1.047197551 / 6.283185306) x 3.141592653 x 25 (c.m.)^2
= 0.16666666666666666666666666666667 x 3.141592653 x 25 (c.m.)^2
= 13.0899693875 (c.m.)^2

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Chairperson: Mr. Dhananjay Shantaram Janorkar

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In English:

Dhananjay Janorkar Discussion Forum on Mathematics, Astrophysics and Science - "DJDFMAS", Village MAHAN – 444 405 Tq. Barshitakli Dist. Akola, (Maharashtra State), India, This Discussion Forum was established by Mr. Dhananjay Shantaram Janorkar, and the main purpose of this Discussion Forum is to solve the difficulties in research, articles / research papers scholars / scientists coming across from different topics in the 'International Journal of Shantaram Janorkar Foundation of Mathematics, Science and Spiritual' or to answer their question and The propagate the research carried out by Late Mr. Shantaram Bapurao Janorkar and popularize the subject of mathematics and to solve the problems in mathematics, science and spirituality. Hence this Forum is established.

'International Journal of Shantaram Janorkar Foundation of Mathematics, Science and Spiritual.' This journal is in 'Print/CD-ROM/Online' formats. It is free of cost in CD-ROM / Online. I have been trying to deliver this journal to the scholars and scientists of 511 universities of India and to the scholars and scientists of 10,877 universities all over the world. I sincerely request to honorable scholars and scientists to continue further my present work. There is such a great extent of knowledge in this research work that the yet to be in completed research will be completed with this research and logic and the world will get to know the real and true knowledge and you can put new theorems before the world created through this research. To help this real and true knowledge put forward before the world is the very primary objective of my efforts. It is said that time and tide waits for none; 'Death' is the eternal truth for all living beings on earth. Hence, it is utmost essential to put forth my research paper in front of the world. I feel, after my death, there will be nobody to put forth or present this research paper in front of the world.

ॐ Purnamadah: Purnamidam Purnat Purnamudachyate I Purnasya Purnamadaya Purna Mevavashisyate II

Honorable scholars and scientists are requested that they should put the questions and queries found in their research on the different subject articles / research papers published only in the "International Journal of Shantaram Janorkar Foundation of Mathematics, Science and Spiritual" - (IJSJFMSS). Mr. Dhananjay Shantaram Janorkar will try to solve the entire question and queries should be answered.

Honorable scholars and scientists for the answers of their questions should fill up the detail information in the enclosed format and send it on the E-mail and given address. Mr. Dhananjay Shantaram Janorkar will try to solve your questions and queries as quick as possible.

Note: In case you want to carry out further research and establish new theorems on the basis of research done by Janorkar, first go in the state of empty mindedness which means should not think of any other research or theorem and when you are in the state of empty mindedness, study the research papers on this theorem not only once or twice but until you fully understand them and think over them. After it, on the basis of Janorkar's theorems start to find your new theorems and you will certainly find new theorems on the basis of this paper on theorem which you can then put before the world through the medium (IJSJFMSS) of the international journal.

The schools, colleges, educational institutions, educational boards, institutes of mathematics, institutes of science, universities, the students of the universities listed in the QS (Quacquarelli Symonds), professors, scholars, scientists, researchers who are preparing research papers on the topics/papers prepared by Janorkar's reseach work, we shall strive to provide them with any facilities, if available. Moreover, in case they face any difficulties while doing research on this topic we shall also try hard to solve these.

Inaugurated the Dhananjay Janorkar Discussion Forum on Mathematics, Astrophysics and Science

Dhananjay Janorkar Discussion Forum on Mathematics, Astrophysics and Science - "DJDFMAS", established by the Organization of "Shantaram Janorkar Foundation of Mathamatics", Village MAHAN Tq. Barshitakli Dist. Akola, (Maharashtra State), India, was Inaugurated On 13/08/2017 at 4.00 P.m. at the head offices of the Organization at Akola by the hands of Hon. Professor Dr. S. D. Katore, (Head, Department of Mathematics, Chairman, Board of Studies in Mathematics, Sant Gadage Baba Amaravati University, Amaravati). The Chief Guest was Hon. Professor Dr. S. W. Bhaware, (Head, Department of Mathematics, Shri R. L. T. College of Science, Akola), and Hon. Professor Mr. D. T. Solanke, (Department of Mathematics, Sudhakar Naik & Umashankar Khetan College, Akola). The President of this function was Mr. Dhananjay S. Janorkar, (Founder President, Shantaram Janorkar Foundation of Mathamatics).

The main purpose of this Discussion Forum is to solve the difficulties in research, research papers scholar/scientists coming across from different topics in the 'International Journal of Shantaram Janorkar Foundation of Mathematics, Science and Spiritual' or to answer their question. For more investigations on this invention Mr. Dhananjay Shantaram Janorkar has created a new rostrum for global scientists and scholars like Ph. D. holders in respect of the same. The said Format of the Discussion Forum can be downloaded free of cost on the web site www.sbjanorkar.com or Google. In the said programme Professor Dr. Mrs. Katore, Mrs. Jija Dhananjay Janorkar, Prof. Uday Janorkar, Shivaji Arts,Commerce and Sciences Collage, Akola, Vaibhav Kakad, Jay Janorkar, Janhavi Janorkar were present at the function. On this occasion Mr. Dhananjay Janorkar appealed to the scientists and research scholars to put their questions and queries before the Discussion Forum and to take the benefit of the organization.

Note ✹ Mul sanshodhan paper hee Marathi Bhashemadhe Aahet. (The Original Research Papers are in Marathi Language).

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मराठी मध्ये (In Marathi):

धनंजय जानोरकर डिस्कशन् फॉरम् ऑन मॅथमॅटिक्स, अस्ट्रॉफिझिक्स् अॅन्ड सायन्स - "DJDFMAS", महान, ता.बार्शिटाकळी, जि.अकोला, पिन कोड - ४४४ ४०५ (महाराष्ट्र राज्य), भारत, या डिस्कशन् फॉरम् ची स्थापना श्री.धनंजय शांताराम जानोरकार यांनी केली असुन या डिस्कशन् फॉरम् चा मुख्य हेतू 'इंटरनॅशनल जरनल ऑफ शांताराम जानोरकार फाऊंडेशन ऑफ मॅथमॅटिक्स, सायन्स अॅन्ड स्पिरीच्युअल' - (IJSJFMSS), या आंतरराष्ट्रीय नियतकालिक मधील वेगवेगळया विषयांचे आर्टीकल / संशोधन पेपर मधील स्कॉलर्स / शास्त्रज्ञांना येत असलेल्या संशोधना मधील अडचनी किंवा त्यांच्या प्रश्नांचे उत्तरे देण्याकरीता व स्वर्गीय श्री.शांताराम बापुराव जानोरकार यांच्या गणित विषयातील संशोधनाच्या कार्याचा प्रसार करणे व गणित विषयाला लोकप्रिय करण्यासाठी आणि गणित, विज्ञान व अध्यात्म मधील समस्या सोडविणे हा आहे. करिता ह्या डिस्कशन् फॉरम् ची स्थापना करण्यात आली.

इंटरनॅशनल जरनल ऑफ शांताराम जानोरकार फाऊंडेशन ऑफ मॅथमॅटिक्स, सायन्स अॅन्ड स्पिरीच्युअल, हे नियतकालिक (Print/CD - ROM/Online) मध्ये आहे. CD-ROM / Online मध्ये मोफत आहे. मी हे नियतकालिक भारत देशातील ५११ व विश्वा मधील १०८७७ विद्यापीठा मधील स्कॉलर्स, शास्त्रज्ञां पर्यंत पोहचविण्याचा प्रयत्न करीत असुन माझे बाकी राहीलेले कार्य आदरणीय स्कॉलर्स, शास्त्रज्ञांनी या पुढे "शांताराम जानोरकार फाऊंडेशन ऑफ मॅथमॅटिक्स" या संस्थे व्दारा ह्या संशोधना वर पुढे संशोधन करून चालू ठेवण्याची कृपा करावी हि माझी त्यांना विनंती आहे. ह्या संशोधित केलेल्या संशोधना मध्ये एवढे काही ओत पोत ज्ञान भरलेले आहे जे आज पर्यंत अपुर्ण असलेले संशोधन ह्या संशोधना मुळे, लॉजीक मुळे पुर्ण होईल खरे आणि सत्य ज्ञान आपणा कडून जगाला कळेल व आपण या संशोधना मधून निर्माण होणारे नवनविन सिध्दांत विश्वा समोर मांडू शकाल. हे सत्य आणि खरे ज्ञान विश्वा समोर यावे व विश्वा मधील सर्वांना सत्य व खरे ज्ञान मिळावे हाच माझा मुळ उद्देश आहे. वेळ कोणाचा होत नसतो, पृथ्वी लोकांचे अंतीम सत्य मृत्यु आहे. ह्या मुळे मी तयार केलेले संशोधन पेपर, विश्वा समोर ठेवने अत्यंत आवश्यक होते. कारण मी, मृत्यु पावल्या नंतर हे संशोधन विश्वा समोर ठेवणारे कोणीच नाही, असे मला वाटते.

ॐ पूर्णमदः पूर्णमिदं पूर्णात् पूर्णमुदच्यते l पूर्णस्य पूर्णमादाय पूर्ण मेवाव शिष्यते ll

आदरणीय स्कॉलर्स, शास्त्रज्ञांना विनंती करण्यात येते की त्यांनी फक्त "इंटरनॅशनल जरनल ऑफ शांताराम जानोरकार फाऊंडेशन ऑफ मॅथमॅटिक्स, सायन्स अॅन्ड स्पिरीच्युअल" - (IJSJFMSS), याच आंतरराष्ट्रीय नियतकालिक मधील वेगवेगळया विषयांचे आर्टीकल / संशोधन पेपर मधील स्कॉलर्स / शास्त्रज्ञांना येत असलेल्या संशोधना मधील अडचनी किंवा प्रश्न विचारावे. त्यांच्या सर्व अडचनी व प्रश्नांची उत्तरे देण्याचा श्री. धनंजय शांताराम जानोरकार हे प्रयत्न करतील.

आदरणीय स्कॉलर्स, शास्त्रज्ञांना पाहिजे असलेल्या प्रश्नांच्या उत्तरांन करिता फॉरमॅट् मध्ये सविस्तर माहीती भरूण दिलेल्या पत्यावर पाठविणे व ई-मेल करणे, आपणास येत असलेल्या संशोधना मधील अडचनी किंवा आपणल्या प्रश्नांचे उत्तरे आपणास लवकरात लवकर देण्याचा / सोडविण्याचा श्री.धनंजय शांताराम जानोरकार हे प्रयत्न करतील.

टिप: आपणास जानोरकारांच्या सिध्दांतांवर पुढे संशोधन करून नविन सिध्दांत प्रस्तापीत करायचे अस्तील तर प्रथम तुम्ही शुन्य ध्यान (झिरो माईन्ड) व्हा म्हणजेच आपल्या डोक्या मध्ये दुसरे संशोधन किंवा सिध्दांता बद्दल कसल्याही प्रकारचा विचार नसने, शुन्य ध्यान (झिरो माईन्ड) झाल्यानंतर ह्या सिध्दांतांचे संशोधन पेपर काळजी पुर्वक एक दोन वेळ नाही तर आपणास समजे पर्यंत वाचा महत्वाचे मुद्दे डोक्या मध्ये घ्या आणि नंतर जानोरकारांच्या सिध्दांतांचा आधार घेवुन आपले नविन सिध्दांत शोधन्यास सुरूवात करा निश्चितच आपणास ह्या सिध्दांताच्या पेपर मध्ये नविन सिध्दांत मिळतील जे तुम्ही विश्वा समोर (IJSJFMSS) ह्या मोफत आंतरराष्ट्रीय नियतकालिके मधुन मांडु शकाल.

जानोरकरांच्या संशोधन टॉपीक्स/पेपर्स वर संशोधन करून, शाळा, कॉलेजस, शैक्षणिक संस्था, शिक्षण महामंडळे, गणित संस्था, विज्ञान संस्था, विद्यापीठे, क्यु एस (क्वेकरेली सायमंड्स) च्या यादितील विद्यापीठां मधील विद्यार्थी, प्राध्यापक वृंद, प्रोफेसर, स्कॉलर्स, शास्त्रज्ञ, संशोधक, संशोधन पेपर तयार करित असतील तर त्यांना आमच्या कडुन शक्य असतील त्या सुविधा उपलब्द करून देण्याचा प्रयत्न करू. तसेच ह्या संशोधनावर संशोधन करित असतांना त्या मध्ये काही अडचणी निर्माण झाल्यास ते सोडविण्याचा काटेकोर पणे प्रयत्न करू.

धनंजय जानोरकर डिस्कशन् फॉरम् ऑन मॅथमॅटिक्स, अस्ट्रॉफिझिक्स् अॅन्ड सायन्स चे उद्घाटन संपन्न

शांताराम जानोरकर फाऊंडेशन ऑफ मॅथमॅटिक्स, महान, या संस्थे व्दारे स्थापीत, धनंजय जानोरकर डिस्कशन् फॉरम् ऑन मॅथमॅटिक्स, अस्ट्रॉफिझिक्स् अॅन्ड सायन्स, ह्या चर्चा मंच चे उदघाटन, प्रा.डॉ.एस.डी.कतोरे, गणित विभाग प्रमुख, तथा अध्यक्ष, गणित अभ्यास मंडळ, संत गाडगे बाबा अमरावती विद्यापीठ, अमरावती, यांचे हस्ते दिनांक:१३/०८/२०१७ रोजी, सायंकाळी:४.०० वाजता, अकोला येथील संस्थेच्या मुख्य कार्यालयात संपन्न झाले. प्रमुख अतिथी म्हणुन प्रा.डॉ.एस.डब्लु.भवरे, गणित विभाग प्रमुख, श्री आर.एल.टी. कॉलेज ऑफ सायन्स, अकोला, प्रा. श्री.डी.टी.सोळंके, सुधाकर नाईक व उमाशंकर खेतान कॉलेज, अकोला, हे होते, तर ह्या कार्यक्रमाचे अध्यक्ष संस्थेचे अध्यक्ष, श्री.धनंजय शांताराम जानोरकार हे होते.

या डिस्कशन् फॉरम् चा मुख्य हेतू इंटरनॅशनल जरनल ऑफ शांताराम जानोरकार फाऊंडेशन ऑफ मॅथमॅटिक्स, सायन्स अॅन्ड स्पिरीच्युअल या आंतरराष्ट्रीय नियतकालिक मधील वेगवेगळया विषयांचे संशोधन पेपर मधील स्कॉलर्स व शास्त्रज्ञांना येत असलेल्या संशोधना मधील अडचनी किंवा त्यांच्या प्रश्नांचे उत्तरे देण्याकरीता, विश्वातील पी.एचडि., च्या स्कॉलर्स ला व शास्त्रज्ञांना ह्या संशोधनावर नविन संशोधन करण्या करिता ह्या डिस्कशन् फॉरम् च्या माध्यमातुन श्री.धनंजय शांताराम जानोरकार यांनी एक नविन व्यासपिठ निर्माण करून दिले. ह्या डिस्कशन् फॉरम् चे फॉरमॅट् www.sbjanorkar.com ह्या वेब साईट वरून किंवा Google वरून मोफत डाउनलोड करू शकता. ह्या कार्यक्रमास प्रा.डॉ.सौ.कतोरे, सौ. जिजा धनंजय जानोरकार, प्रा.उदय जानोरकार, शिवाजी आर्ट, कॉमर्स अॅड सायन्स कॉलेज, अकोला, वैभव काकळ, जय जानोरकार, जान्हवी जानोरकार यांची उपस्थिती लाभली. ह्या प्रसंगी पी.एचडि. चे संशोधक व शास्त्रज्ञांनी सदर चर्चा मंच च्या आयोजनाचा लाभ घ्यावा व आपले प्रश्न चर्चा मंच मध्ये सादर करावे असे आवाहन श्री.धनंजय जानोरकार यांनी केले.

टिप ✹ मुळ संशोधन पेपर हे मराठी भाषेमध्ये आहेत. *(The Original Research Papers are in Marathi Language).*

मुख्य कार्यालय:- व्दारा आर.टि.पाटील यांचे घर, सरस्वती विघालया जवळ, नित्यानंद नगर, गौरक्षण रोड, अकोला - ४४४ ००४, ता. व जि.अकोला, (महाराष्ट्र राज्य), भारत

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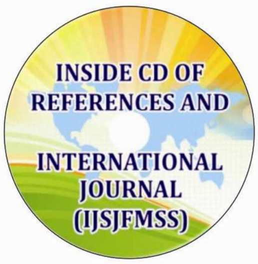

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