New Method-EYE FALL METHOD-RAM'S METHOD for Finding Any One of the Chords of Given Circle which is Equal to the Radius of Same Circle Via Geometrical Diagram by Using Only the Compass & Pencil Without Using Any Measuring Tools

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Abstract
The Aim of this research is finding New Method for finding any one of the Chords of Given Circle which is equal to the Radius of same Circle via Geometrical Diagram by using only the Compass & Pencil without using any measuring tools.

Keywords: New Method Procedure, Finding the Chord which is equal to the Radius, Using only the Compass & Pencil

1. Introduction

In Our Previous Research, We have found the New Method (**EYE FALL METHOD**) for finding the Centre Point of Given Circle, Which titled New Method for finding the Centre Point of Given Circle via Geometrical Diagram by using only the Compass & Pencil without using any measuring tools, and Consequently We can find the Radius (r) and Diameter (d) of Given Circle was Successfully Verified & Published in IJFMR Journal in Volume 6 Issue 3.

Further to that research, By Using the same method **(EYE FALL METHOD),** We are finding any one of the Chords of Given Circle which is equal to the Radius of same Circle via Geometrical Diagram by using only the Compass & Pencil without using any measuring tools.

In this Research, The Name of this founded Method is being Updated by the Authors as **EYE FALL METHOD – RAM'S METHOD**

This Method Procedure is Explained with Geometrical Diagram & Proved with derivation in the Following.

Theoretical Explanation of the Previous Research & this Current Research also is Given in the Following

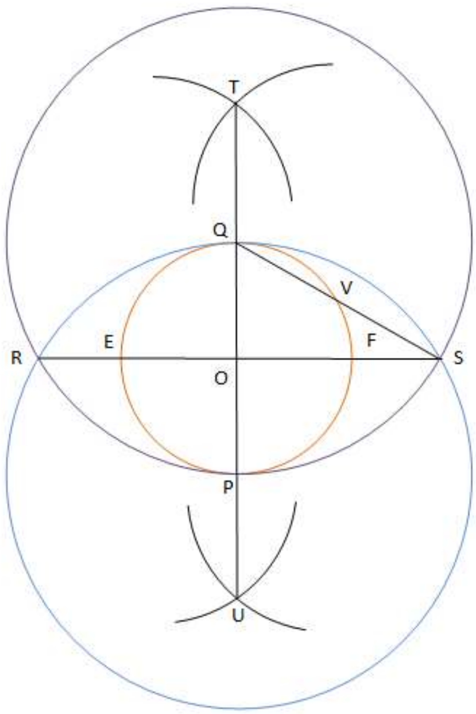
2. Materials Used

The below Materials are being used for this research in this Method for finding any one of the Chords of Given Circle which is equal to the Radius of same Circle via Geometrical Diagram & Proving the same with Graph Sheet & Derivational Proof Diagram.

- Compass
- Pencil
- Drawing Sheet
- Graph Sheet

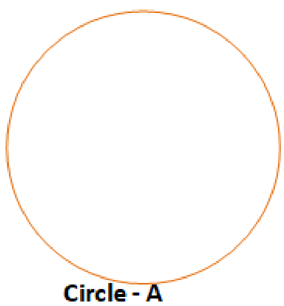
3. Proposed Geometrical Diagram with the Result founded the Chord (QV) of Given Circle which is equal to the Radius of same Circle

The below Geometrical Diagram will be the Result of this method as Where We will be Obtained the Centre Point (O) of the Given Circle-A & One of the Chords (QV) of Given Circle which is equal to Radius of same Circle by Using Only the Compass & Pencil without using any measuring tools.



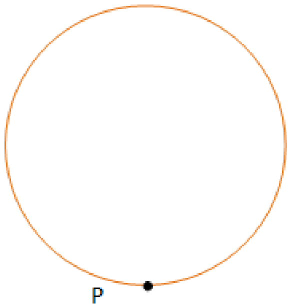
4. Method Procedure

- Consider the Circle-A is given, for Which, We need to find the Chord which is equal to Radius, Where, We don't know any Measurement, Size and Dimensions of this Circle-A.

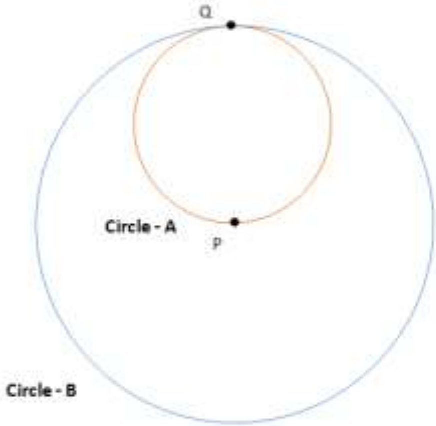


Circle - A

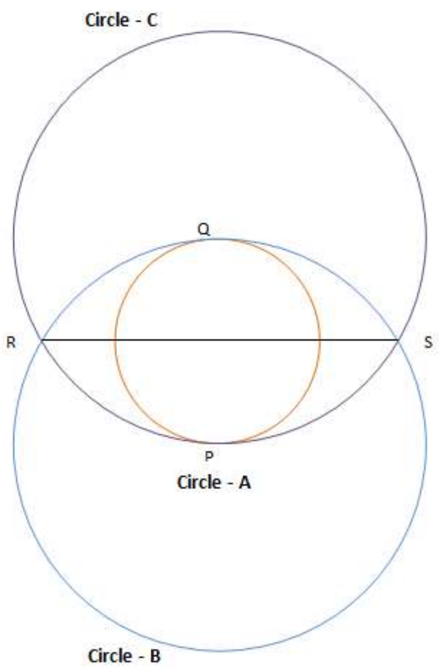
- Marking a Point **P** on anywhere of the Circumference of Circle-A.



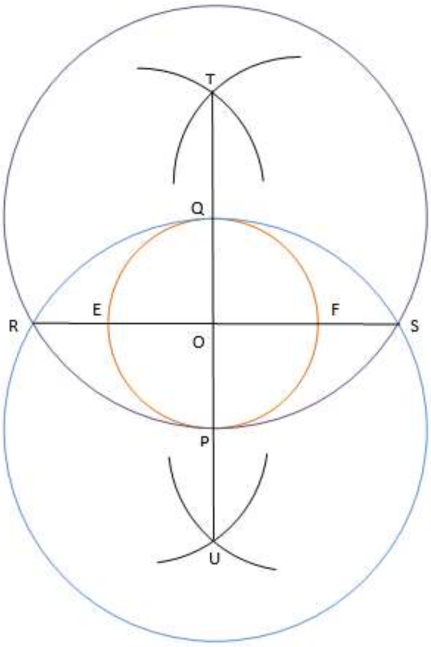
- Using the Compass & Pencil, We are Drawing the Circle-B like which touches the Circle-A Internally by keeping the Point **P** as a centre of Circle-B.
- Now, We are getting a Point **Q** Where the Circle-A and Circle-B touches internally.



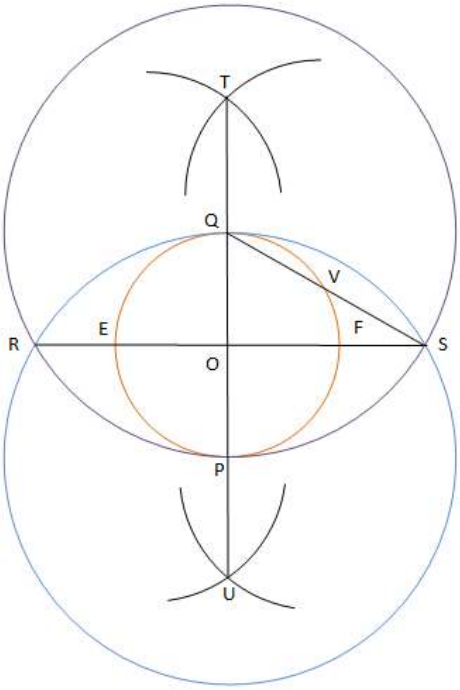
- Using the Compass & Pencil , We are Drawing the Circle-C like which touches the Circle-A Internally by keeping the Point **Q** as a centre of Circle-C.
- Now, We are getting the Points **R** and **S** where the Circle-B & Circle-C both are intersecting each other.
- We are joining the Points **R** and **S** by Line Segment.



- Using the Compass & Pencil, We are drawing the Perpendicular Bisector of $\overline{RS}$.
- Now, We are getting the Bisector Line Segment $\overline{TU}$.
- Now, We are getting the Point **O** where the Line Segment $\overline{RS}$ and $\overline{TU}$ Both are intersecting each other.
- The Point **O** is the Centre Point of the Circle-A.



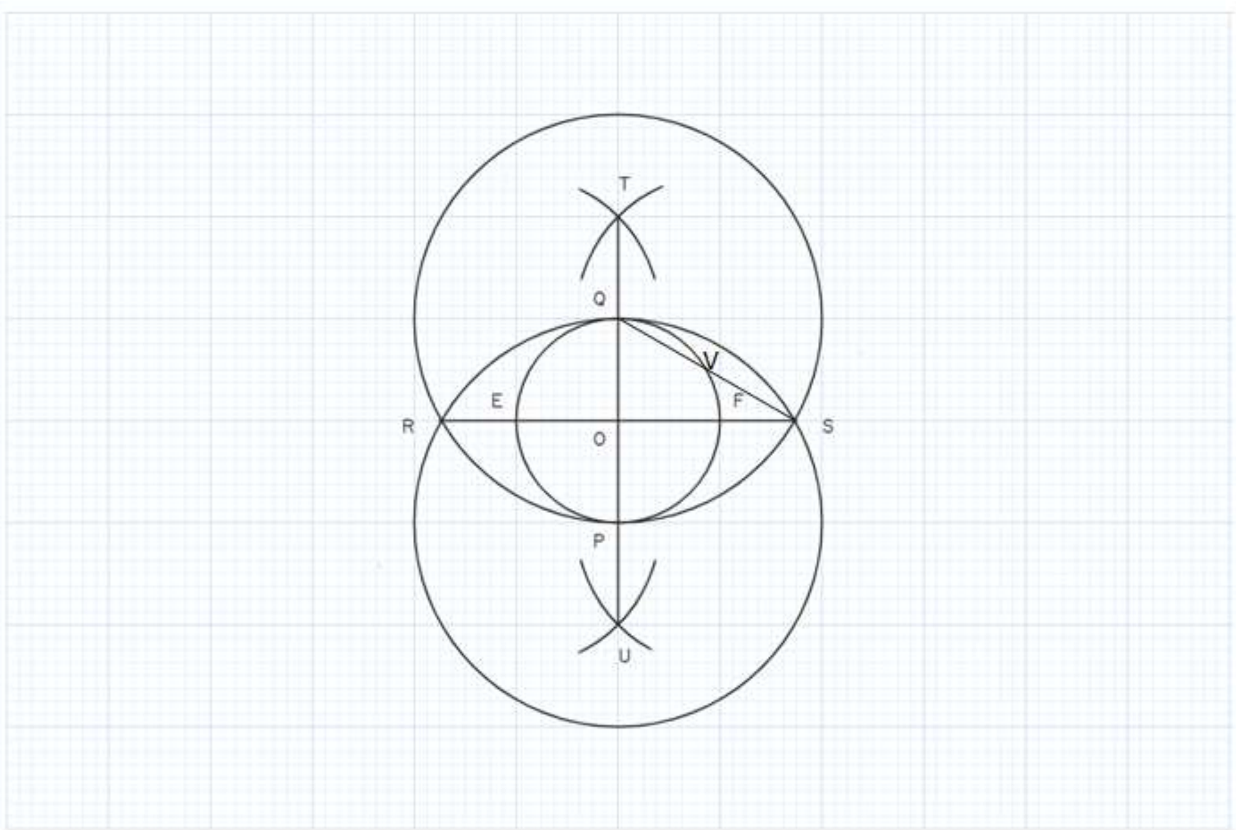
- Now, We are joining the Points Q and S by Line Segment $\overline{QS}$
- Now, We are getting the Point V where the Line Segment QS and Circle-A Both are intersecting each other
- The Line Segment $\overline{\textbf{QV}}$ **is one of the Chords of Circle-A which is equal to Radius** of same Circle-A



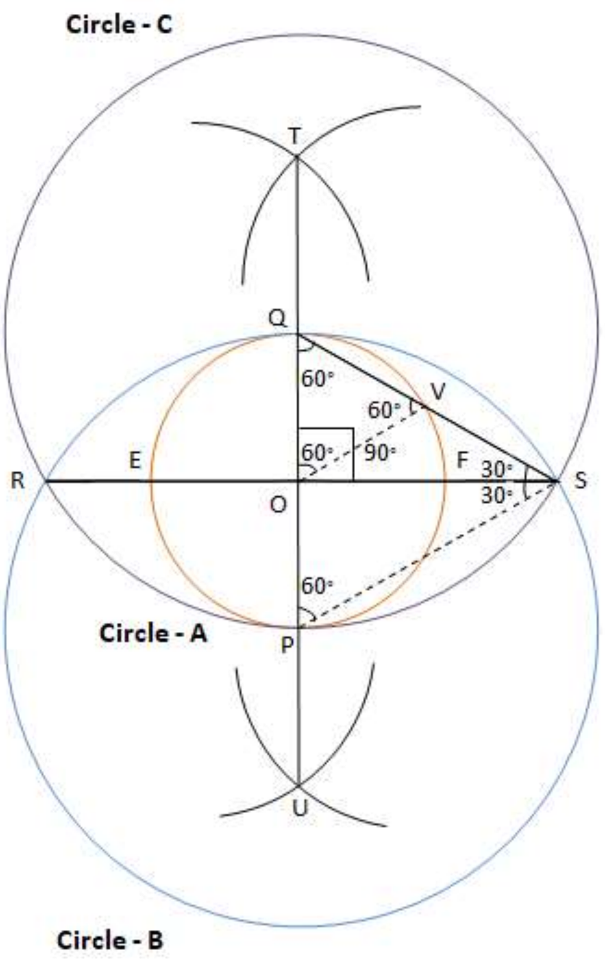
5. GRAPHICALLY PROOF (For O is the Centre Point of the Circle-A)

We have followed the above same Method Procedure for drawing the same Diagram in Graph

- Consider the Circle-A is given, for Which, We need to find the Chord which is equal to Radius, Where, We don't know any Measurement, Size and Dimensions of this Circle-A.
- Marking a Point **P** on anywhere of the Circumference of Circle-A.
- Using Compass & Pencil , We are Drawing the Circle-B like which touches the Circle-A Internally by keeping the Point **P** as a centre of Circle-B.
- Now, We are getting a Point **Q** Where the Circle-A and Circle-B touches internally.
- Using Compass & Pencil , We are Drawing the Circle-C like which touches the Circle-A Internally by keeping the Point **Q** as a centre of Circle-C.
- Now, We are getting the Points **R** and **S** where the Circle-B & Circle-C both are Intersecting each other.
- We are joining the Points **R** and **S** by Line Segment.
- Using Compass & Pencil, We are drawing the Perpendicular Bisector of $\overline{RS}$.
- Now, We are getting Bisector Line Segment $\overline{TU}$.
- Now, We are getting the Point **O** where the Line Segment $\overline{RS}$ and $\overline{TU}$ Both are intersecting each other.
- The Point **O** is the Centre Point of the Circle-A.



6. DERIVATIONAL PROOF (For QV is one of the Chords of Circle-A which is equal to Radius)
With Geometrical Result Diagram



According to the Geometrical Result Diagram & Graphically Proof Diagram
Point **O** is the Centre Point of the Circle-A
Hence, Further
Q = Centre Point of Circle-C
QP = QS = Radius of Circle-C
QP = QS ……………………………………………..(1)
P = Centre Point of Circle-B
QP = PS = Radius of Circle-B
QP = PS ………………………………………………(2)
By Equation (1) and (2)
QP = QS = PS ………………………………………………(3)
Here,
QPS is a Triangle
By Equation (3) In Δ QPS, QP = QS = PS Then,
Δ QPS is a Equilateral triangle
If QPS is a Equilateral triangle, then,

$\angle Q = \angle P = \angle S = 60°$ ………………………………………………….(4)
In Δ QPS, OS is Angle bisector of ∠S
Δ QOS is a Right triangle
Then, In Δ QOS
$\angle O = 90°$
$\angle Q = 60°$
$\angle S = 30°$
In This We are getting another triangle Δ QOV
In Δ QOV,
OQ = OV = Radius of Circle-A
By Equation (4)
$\angle Q = 60°$
According the Theorem - Angle opposite to equal sides of triangle are equal, Hence,

If OQ = OV

$\angle Q = \angle V = 60°$ …………………………………………………….(5)
According the Theorem - The sum of interior angles of a triangle is 180°, Hence,
In Δ QOV
$\angle Q + \angle V + \angle O = 180°$
By Equation (5)
$60° + 60° + \angle O = 180°$
$\angle O = 180° - 120°$
$\angle O = 60°$
In Δ QOV, $\angle Q = \angle V = \angle O = 60°$, Hence,
Δ QOV is a Equilateral triangle
Hence,
QO = OV = QV
OQ = OV = QV
Hence,
Radius of Crile-A = OQ = OV = QV = Chord of the Crile-A ………………. Is Proved

7. Result

According to this research method, By Using only the Compass & Pencil, We have found one of the Chord of Given Circle-A which is equal to the Radius of same Circle-A without any measuring tools Here,

According to Geometrical Result Diagram & Graphically Proof Diagram
O = Centre Point of Circle-A
$\overline{OQ} == \overline{OV}$ = Radius of the Circle-A = r
$\overline{QV}$ = Chord of Circle-A
According to Geometrical Result Diagram & Derivational Proof Diagram
O = Centre Point of Circle-A
$\overline{OQ} == \overline{OV}$ = Radius of the Circle-A = r

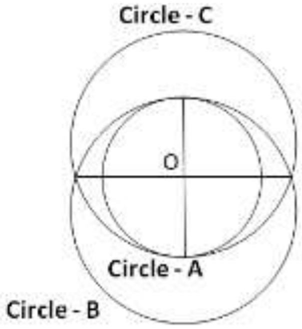
$\overline{QV}$ = Chord of Circle-A

Radius of Circle-A = OQ = OV = QV = Chord of the Circle-A

8. Theoretical Explanation

Ram's Theorem – 1 (Published in Previous Research)

When Two Different Circles of Same Radius (Circle-B & Circle-C) touches the Circle-A Internally in different points of Circumference of Circle-A , The Joining Line of The Intersection Points of Circle-B & Circle-C always goes through the Centre Point of Circle-A.

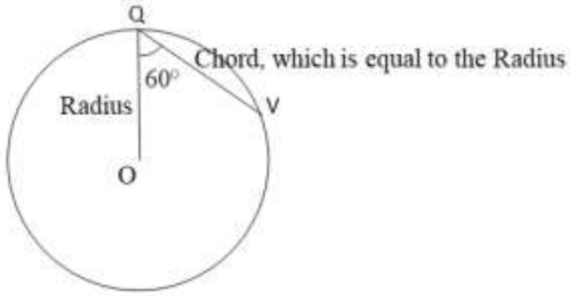


Here, The Condition Should be always

1. Radius of Circle-B > Radius of Circle-A,
2. Radius of Circle-C > Radius of Circle-A,
3. Radius of Circle-B = Radius of Circle-C.

Ram's Theorem – 2 (In Current Research)

In a Circle, If, The angle between the Radius & the Chord lies 60° at the point of Circumference of Circle, Then, That Chord is equal to the Radius



9. Conclusion

Observing the Result of Geometrical Diagram & Graph Sheet Diagram & Derivational Proof Diagram which was Drawn by this New Method, It is noticed that One of the Chords of Given Circle which is equal to the Radius of same Circle has been found exactly.

Hence, the conclusion is that The found New Method (**EYE FALL METHOD - RAM'S METHOD**) for finding One of the Chords of Given Circle which is equal to the Radius of same Circle via Geometrical Diagram by using only the Compass & Pencil without using any measuring tools is accurate and has been Successfully Verified.

10. References

1. Previous Research Paper – New Method for Finding the Centre Point of Given Circle via Geometrical Diagram by using only the Compass & Pencil without using any Measuring Tools - Ramkumar M, Mahalakshmi B - IJFMR - Volume 6, Issue 3, May-June 2024. – DOI- https://doi.org/10.36948/ijfmr.2024.v06i03.23527
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