New Method for Finding the Centre Point of Given 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 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

Keywords: New Method Procedure, Finding the Centre Point of Given Circle, Using only the Compass & Pencil

1. Introduction

According to the References of this Research, In Mathematics, There are several methods for finding the Centre Point of the Given Circle via Geometrical Diagram such as Drawing Crossed Lines,Using a Straightedge and a Triangular Ruler, Drawing the perpendicular bisectors of the chord and etc…

The Aim of this research is finding 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.

This founded New Method is being Named by the Authors as **EYE FALL METHOD.** The Reason & Explanation & Proof of this Naming is attached in the Following.

This Method Procedure is Explained with Geometrical Diagram & Proved with Virtual Graph Sheet in the Following.

2. Materials Used

The below Materials are being used for this research in this Method for finding the Centre Point of Given Circle via Geometrical Diagram & Proving the same with Graph Sheet.

- Compass
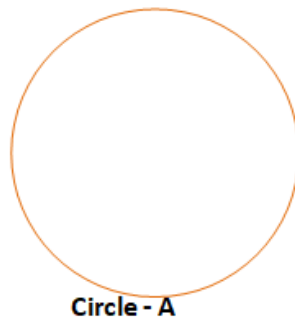- Pencil
- Drawing Sheet
- Graph Sheet

3. Proposed Geometrical Diagram with the Result founded Centre Point (O) of Circle-A

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 by Using Only the Compass & Pencil without using any measuring tools, and Consequently We can find the Radius (r) and Diameter (d) of Circle-A.
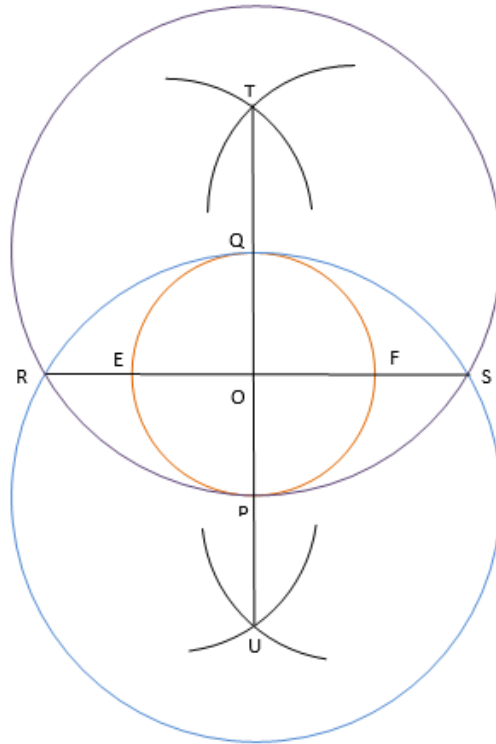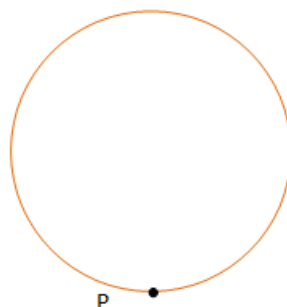

4. Method Procedure

- Consider the Circle-A is given, for Which, We need to find the Centre Point 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.
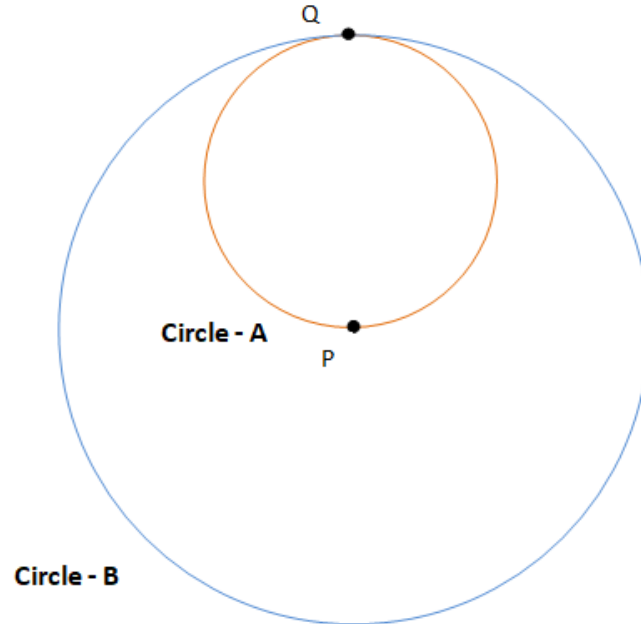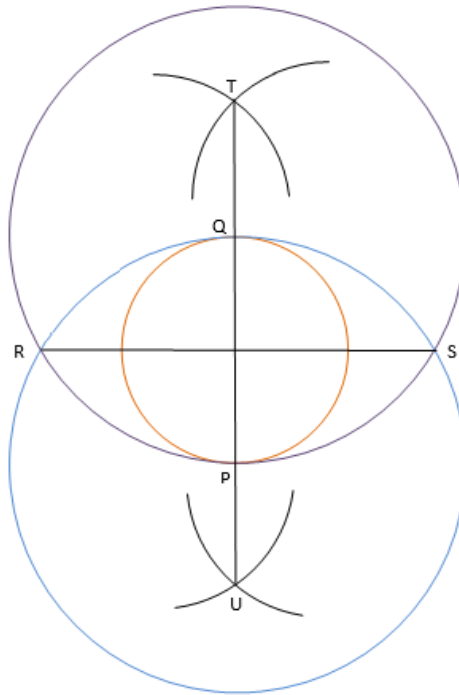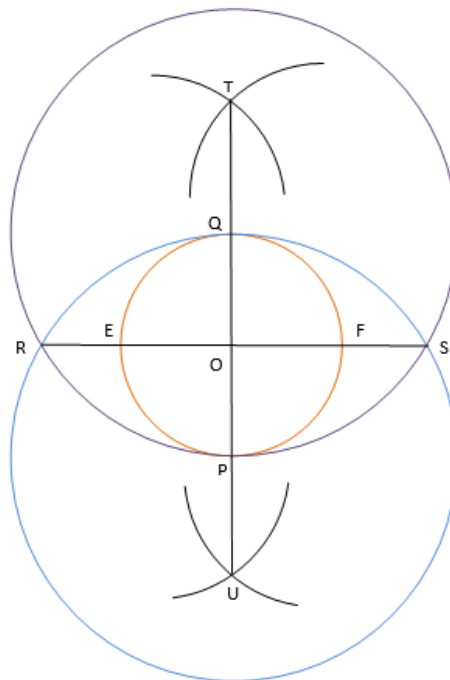

- Using the Compass & Pencil , We are Drawing the Circle-C like which touches the Circle-A Internally by keeping the Point **Q** as a centre of Circle-C.
- Now, We are getting the Points **R** and **S** where the Circle-B & Circle-C both are intersecting each other.
- We are joining the Points **R**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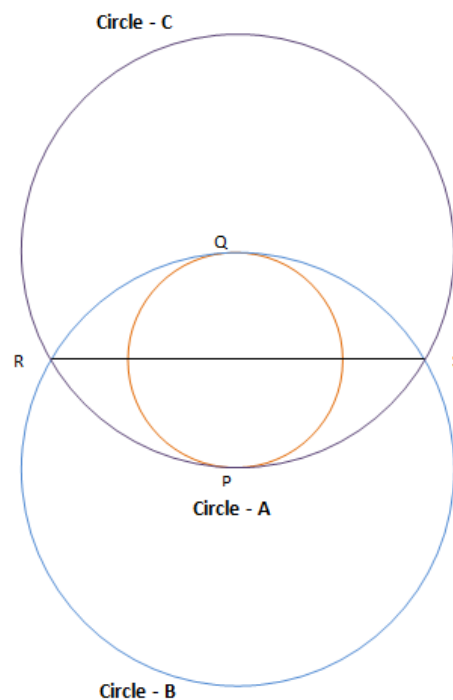
- Using the Compass & Pencil, We are drawing the Perpendicular Bisector of $\overline{RS}$.
- Now, We are getting the Bisector Line Segment $\overline{TU}$.

- 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.

5. GRAPHICALLY PROOF (With Virtual Graph Sheet)
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 Centre **Point** 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.
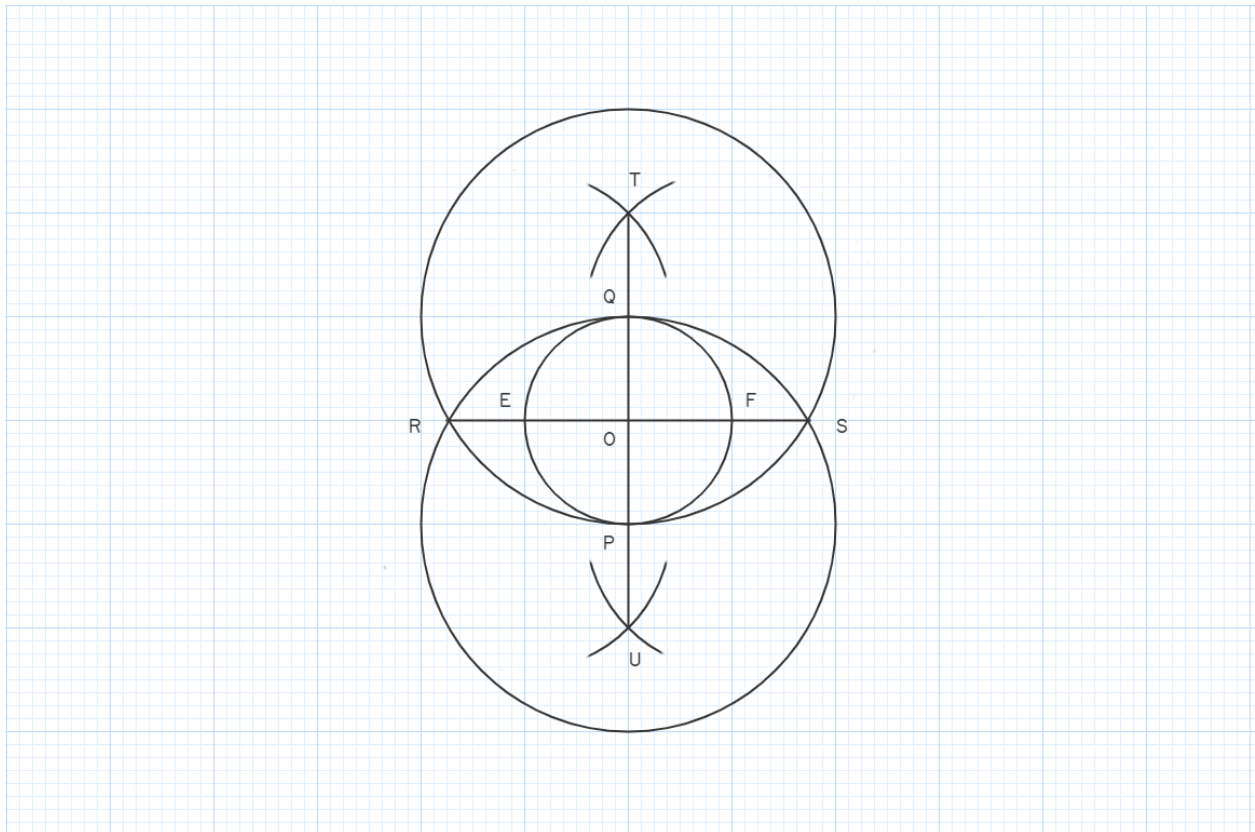
6. Result

According to this research method, By Using only the Compass & Pencil, We have found the Centre Point (O) of Given Circle-A without any measuring tools and Consequently We have found the Radius (r) and Diameter (d) of Circle-A.

Here,

In Geometrical Diagram

O = Centre Point of Circle-A

$\overline{OP} = \overline{OQ} = \overline{OE} = \overline{OF}$=Radius of the Circle-A = r

$\overline{PQ} = \overline{EF}$ = Diameter of the Circle-A = d = 2 × r

In Graphically Proof Diagram (With Virtual Graph Sheet)

We consider in Virtual Graph Sheet   1 Unit = 1 cm

Hence,

O = Centre Point of Circle-A

$\overline{OP} = \overline{OQ} = \overline{OE} = \overline{OF}$ = 1unit = 1cm = Radius of the Circle-A = r

$\overline{PQ} = \overline{EF}$ = 2 units = 2 cms = Diameter of the Circle-A = d = 2 × r


7. Theoretical Explanation

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.
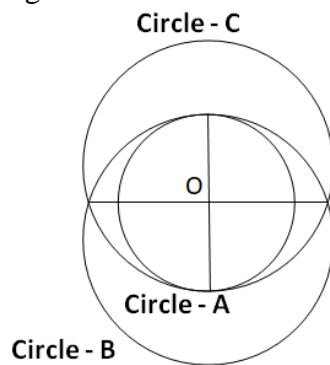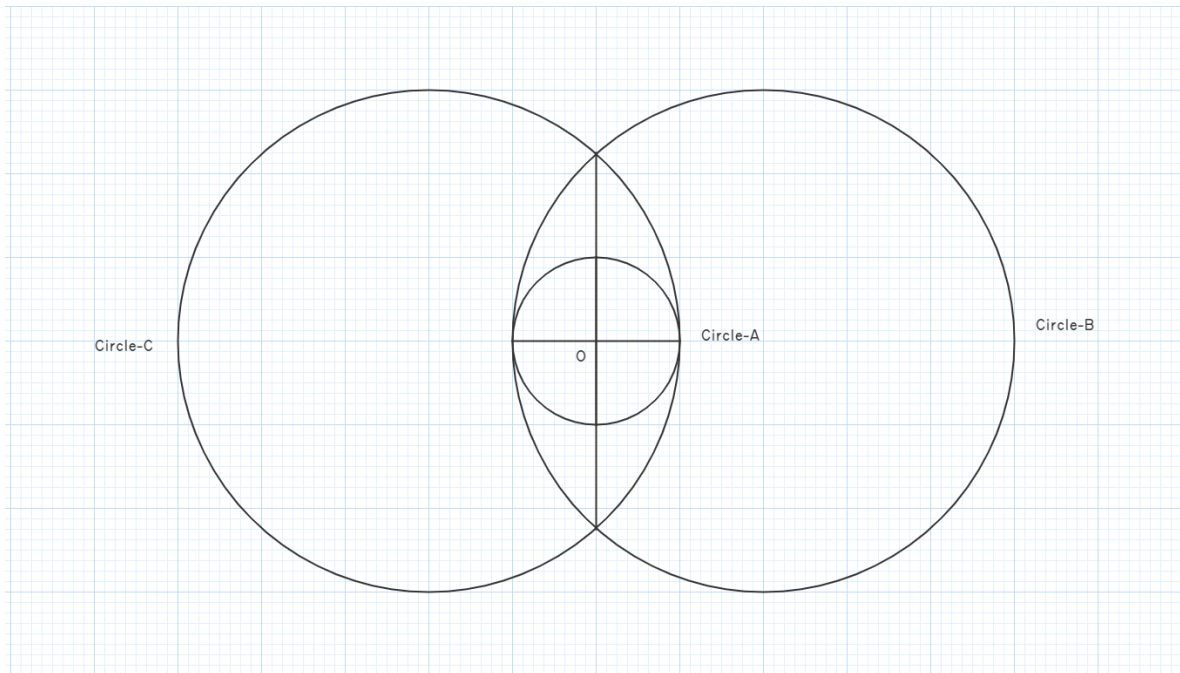

Here, The Condition Should be always

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.

Some Graph Sheet Proofs for the Theoretical Explanation
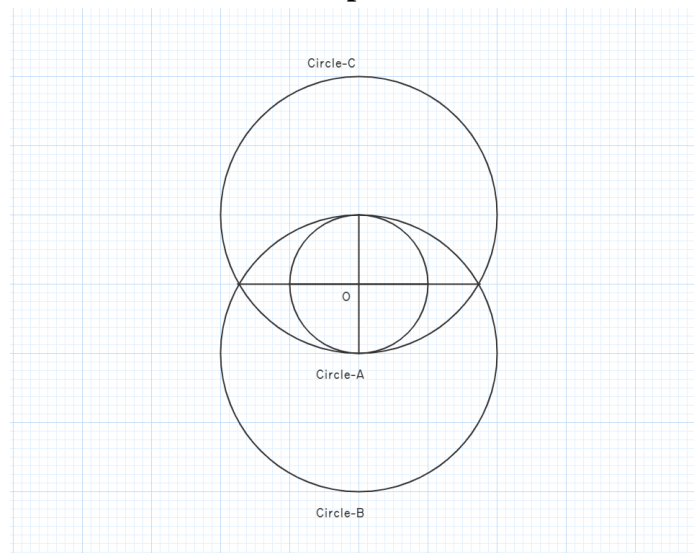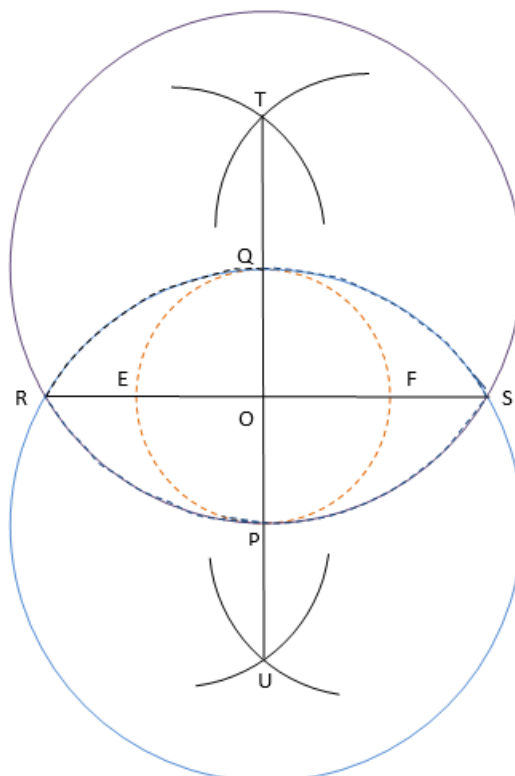
8. Naming for this Method

We are Naming for this Method of Finding Centre Point of Circle – **EYE FALL METHOD.**

Reason & Explanation -

In the Result Diagram of this method, There is EYE Type Segment is getting fallen,

Hence, We are Naming for this Method as - **EYE FALL METHOD.**

Proof -

The Hidden Line Segment is looks like EYE in the Result Diagram.

9. Conclusion

Observing the Result of Geometrical Diagram & Graph Sheet Diagram which was Drawn by this New Method, It is noticed that The Centre Point of given Circle-A has been found exactly and Consequently the Radius (r) and Diameter (d) of Circle-A also have been found.

Hence, the conclusion is that The found New Method (**EYE FALL 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 finding the Radius (r) and Diameter (d) of Given Circle is accurate and has been Successfully Verified.

10. References

1. EUCLID'S ELEMENTS OF GEOMETRY, The Greek text of J.L. Heiberg (1883–1885) - ELEMENTS BOOK 3 - Fundamentals of Plane Geometry Involving Circles - Proposition 5 & Proposition 6