

# District Maths Teachers Workshop

## Feb 21

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From Karnataka Open Educational Resources

ಕನ್ನಡದಲ್ಲಿ ನೋಡಿ ([https://karnatakaeducation.org.in/KOER/index.php/%E0%B2%9C%E0%B2%BF%E0%B2%B2%E0%B3%8D%E0%B2%B2%E0%B2%BE\\_%E0%B2%97%E0%B2%A3%E0%B2%BF%E0%B2%A4\\_%E0%B2%B6%E0%B2%BF%E0%B2%95%E0%B3%8D%E0%B2%B7%E0%B2%95%E0%B2%B0\\_%E0%B2%95%E0%B2%BE%E0%B2%B0%E0%B3%8D%E0%B2%AF%E0%B2%BE%E0%B2%97%E0%B2%BE%E0%B2%B0\\_%E0%B2%AB%E0%B3%86%E0%B2%AC%E0%B3%8D%E0%B2%B0%E0%B2%B5%E0%B2%B0%E0%B2%BF\\_21?veaction=edit](https://karnatakaeducation.org.in/KOER/index.php/%E0%B2%9C%E0%B2%BF%E0%B2%B2%E0%B3%8D%E0%B2%B2%E0%B2%BE_%E0%B2%97%E0%B2%A3%E0%B2%BF%E0%B2%A4_%E0%B2%B6%E0%B2%BF%E0%B2%95%E0%B3%8D%E0%B2%B7%E0%B2%95%E0%B2%B0_%E0%B2%95%E0%B2%BE%E0%B2%B0%E0%B3%8D%E0%B2%AF%E0%B2%BE%E0%B2%97%E0%B2%BE%E0%B2%B0_%E0%B2%AB%E0%B3%86%E0%B2%AC%E0%B3%8D%E0%B2%B0%E0%B2%B5%E0%B2%B0%E0%B2%BF_21?veaction=edit))

Bengaluru South DIET Mathematics online course - Demonstration and hands-on Geogebra to teach BPT and Frustum

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## Objectives of workshop

1. Familiarity with idea of congruence, similarity and similar triangles
2. Visualizing BPT - If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Logical proof of BPT
3. Visualizing area of Frustum of a Cone (3D)

## Improve display of Geogebra on your phone

1. Use in landscape mode
2. Full screen our presentation
3. Desktop option on phone
4. If in difficulty, simply refresh the screen.

## Session plan

1. Congruence

1. Segment, angle, triangle, quadrilateral, odd shaped figures
2. Measures of corresponding sides and angles of congruent polygons will be equal
2. Similarity
  1. Any circle is similar to any other circle.
  2. Same holds for Square - <https://geogebra.org/m/ceapgrs5> (<https://www.geogebra.org/m/ceapgrs5>)
  3. and Equilateral Triangles and <https://geogebra.org/m/kpww6afy> (<https://www.geogebra.org/m/kpww6afy>)
  4. Quadrilaterals
    1. Two quadrilaterals of the same number of sides are similar, if
      1. (i) their corresponding angles are equal and
      2. (ii) their corresponding sides are in the same ratio (or proportion)
  5. Triangle - <https://geogebra.org/m/mdc43fbt> (<https://www.geogebra.org/m/mdc43fbt>)
    1. if all angles of one are congruent with the corresponding angles of the second (AAA)
    2. if the ratio of three corresponding sides are equal (SSS)
3. Concept of height of a triangle. <https://geogebra.org/m/k56qc3hm> (<https://www.geogebra.org/m/k56qc3hm>)
  1. The height of a triangle will be inside the triangle (acute angled triangle), outside the triangle (obtuse angled triangle) and on the side of the triangle (right triangle)
  2. Selection of side as base can change, but area (half \* base \* height) does not change
4. BPT - If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
  1. Draw few triangles and check that this is true - visual proof <https://geogebra.org/m/nctk4smk>
  2. Logical Proof of BPT - <https://geogebra.org/m/pjdj65cd> (<https://www.geogebra.org/m/pjdj65cd>)

## Time plan

1. Introduction to <http://geogebra.org>. Enable 'Desktop view' and 'Landscape view' on phone - 15 minutes
2. Demo and hands-on - Congruence - 15 minutes, Similarity 20 minutes. BPT 20 minutes. Frustum of Cone - 10 minutes
3. Closing way forward + [Google form \(https://teacher-network.in/limesurvey/index.php/575443?lang=en\)](https://teacher-network.in/limesurvey/index.php/575443?lang=en) - 10 minutes.

## General Instructions for using the files

1. Open Geogebra.org and login with id **Ganithageogebra**, password - **geogebra123**
2. You can click on the link to open the file (or folder) on your computer or phone with Internet connectivity
3. You can move the objects to coincide with the other object, by selecting the object and using 'drag and drop' of your mouse/cursor.
4. You can also move the object by move the red point and rotating with the yellow point on an object.
5. Practice drag and drop using mouse cursor on the computer and your finger on your phone.
6. Use the file in the sequence of "check boxes" (Tick mark off/ on)
7. Check box - click on it to ON. Click again to OFF
8. When needed, move the "Slider" - Move to increase or reduce value of variable (like audio volume

control)

9. Uncheck a check-box when not needed or to reduce information on the screen
10. You can download the file to your own computer, see the steps given in video <https://youtu.be/ECFKjQXT6IE> (<https://www.youtube.com/watch?v=ECFKjQXT6IE&feature=youtu.be>) (see from 1.40 to 2.00 minutes)
11. You can install Geogebra on your computer having Microsoft Windows and also on your android phone, through Google play (Geometry app)
12. You can show in your class using the Geogebra on your computer, or if you have connectivity, directly from the website, connecting to projector.
13. Students can also see and play with these files on their own phone or using the computer lab.

## **Access Geogebra resources**

You can open the link in the table below on your computer or your phone

Particulars	Link
Connect to Internet - <a href="https://Geogebra.org">https://Geogebra.org</a> ( <a href="https://www.geogebra.org/">https://www.geogebra.org/</a> ) Sign in with user id - Ganithageogebra Password → geogebra123	<a href="https://Geogebra.org">https://Geogebra.org</a> ( <a href="https://www.geogebra.org/">https://www.geogebra.org/</a> )
Open the Geogebra file Congruence 1 (3 sets) ( <a href="https://www.geogebra.org/m/xk6upuuu">https://www.geogebra.org/m/xk6upuuu</a> )	<a href="https://geogebra.org/m/xk6upuuu">https://geogebra.org/m/xk6upuuu</a> ( <a href="https://www.geogebra.org/m/xk6upuuu">https://www.geogebra.org/m/xk6upuuu</a> )
Open the Geogebra file Congruence 2 (5 sets) ( <a href="https://www.geogebra.org/m/dyydtqex">https://www.geogebra.org/m/dyydtqex</a> )	<a href="https://geogebra.org/m/dyydtqex">https://geogebra.org/m/dyydtqex</a> ( <a href="https://www.geogebra.org/m/dyydtqex">https://www.geogebra.org/m/dyydtqex</a> )
Open the Geogebra file Congruence 3 (Changing length) ( <a href="https://www.geogebra.org/m/tsxucse8">https://www.geogebra.org/m/tsxucse8</a> )	<a href="https://geogebra.org/m/tsxucse8">https://geogebra.org/m/tsxucse8</a> ( <a href="https://www.geogebra.org/m/tsxucse8">https://www.geogebra.org/m/tsxucse8</a> )
Open the Geogebra file Similarity 1 (Circles) ( <a href="https://www.geogebra.org/m/ceapgrs5">https://www.geogebra.org/m/ceapgrs5</a> )	<a href="https://geogebra.org/m/ceapgrs5">https://geogebra.org/m/ceapgrs5</a> ( <a href="https://www.geogebra.org/m/ceapgrs5">https://www.geogebra.org/m/ceapgrs5</a> )
Open the Geogebra file Similarity 2 (Squares) ( <a href="https://www.geogebra.org/m/kpww6afy">https://www.geogebra.org/m/kpww6afy</a> )	<a href="https://geogebra.org/m/kpww6afy">https://geogebra.org/m/kpww6afy</a> ( <a href="https://www.geogebra.org/m/kpww6afy">https://www.geogebra.org/m/kpww6afy</a> )
Open the Geogebra file Similarity 3 (Rectangles) ( <a href="https://www.geogebra.org/m/jn8j4yut">https://www.geogebra.org/m/jn8j4yut</a> )	<a href="https://geogebra.org/m/jn8j4yut">https://geogebra.org/m/jn8j4yut</a> ( <a href="https://www.geogebra.org/m/jn8j4yut">https://www.geogebra.org/m/jn8j4yut</a> )
Open the Geogebra file Similarity 4 (Equilateral Triangles) ( <a href="https://www.geogebra.org/m/kgrsaazu">https://www.geogebra.org/m/kgrsaazu</a> )	<a href="https://geogebra.org/m/kgrsaazu">https://geogebra.org/m/kgrsaazu</a> ( <a href="https://www.geogebra.org/m/kgrsaazu">https://www.geogebra.org/m/kgrsaazu</a> )
Open the Geogebra file Similarity 5 (Generic Triangles) ( <a href="https://www.geogebra.org/m/mdc43fbt">https://www.geogebra.org/m/mdc43fbt</a> )	<a href="https://geogebra.org/m/mdc43fbt">https://geogebra.org/m/mdc43fbt</a> ( <a href="https://www.geogebra.org/m/mdc43fbt">https://www.geogebra.org/m/mdc43fbt</a> )
Open the Geogebra file BPT 1 - Altitude of a triangle ( <a href="https://www.geogebra.org/m/k56qc3hm">https://www.geogebra.org/m/k56qc3hm</a> )	<a href="https://geogebra.org/m/k56qc3hm">https://geogebra.org/m/k56qc3hm</a> ( <a href="https://www.geogebra.org/m/k56qc3hm">https://www.geogebra.org/m/k56qc3hm</a> )
Open the Geogebra file BPT 1 - Visual proof ( <a href="https://www.geogebra.org/m/nctk4smk">https://www.geogebra.org/m/nctk4smk</a> )	<a href="https://geogebra.org/m/nctk4smk">https://geogebra.org/m/nctk4smk</a> ( <a href="https://www.geogebra.org/m/nctk4smk">https://www.geogebra.org/m/nctk4smk</a> )
Open the Geogebra file BPT 1 - Logical proof ( <a href="https://www.geogebra.org/m/pjdj65cd">https://www.geogebra.org/m/pjdj65cd</a> )	<a href="https://geogebra.org/m/pjdj65cd">https://geogebra.org/m/pjdj65cd</a> ( <a href="https://www.geogebra.org/m/pjdj65cd">https://www.geogebra.org/m/pjdj65cd</a> )
Surface Area and Volume of a Frustum from a Cone ( <a href="https://www.geogebra.org/m/ujr94b2p">https://www.geogebra.org/m/ujr94b2p</a> )	<a href="https://www.geogebra.org/m/ujr94b2p">https://www.geogebra.org/m/ujr94b2p</a>

**To learn more about Geogebra visit the [Learn Geogebra \(https://teacher-network.in/OER/index.php/Learn\\_Geogebra\)](https://teacher-network.in/OER/index.php/Learn_Geogebra) page**

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