

Chapter – 10 Geometry - Pythagoras theorem

Objective :

Using GeoGebra, the students will be able

- to identify and use the required tools to draw a semi-circle on right angled triangle
- to identify and use the required tools to draw a regular polygon
- to measure the area of the polygon
- to verify the Pythagoras theorem

Skills to be attained: Construct the Pythagoras theorem using GeoGebra Tools.

Tools/website/Resources: GeoGebra

Teacher-led instruction:

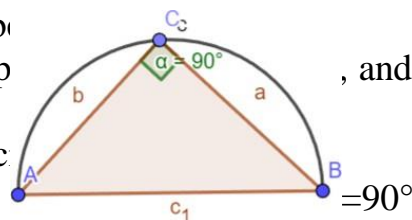
Open Graphics View → Draw the Semi Circle → Draw a Right-angled triangle → Construct squares → Measure the areas → Compare the values

Open: Start GeoGebra on your computer or use the web version at [geogebra.org](https://www.geogebra.org). Right-click on the graphics view, and hide the axis and grid.

Set the number of decimal places → Options → Rounding → Select Number of decimal places → 2 Decimal Place

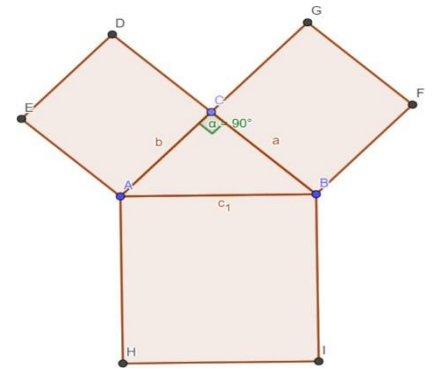
Step 1 Draw a Right-angled triangle

- Go to Circle and Arc tools, Select Semicircle tool
- Two clicks on the Graphics view then a semicircle will be drawn.
- Go to the polygon tool, click points A, B, and any one point on the semicircle, and finally click on point A.
- Now, the right-angled triangle ABC appears in the semicircle.
- Select the Angle tool, click on the sides of triangle ABC. The angle at vertex C will appear.



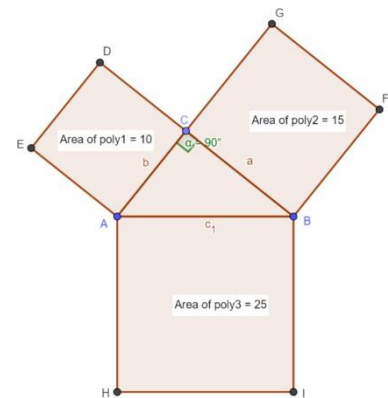
Step 2 Construct Squares

- Right-click on the semicircle and choose the show object. semi circle will disappear.
- Select the Regular Polygon tool
- The first two clicks on points A and C.
- Enter 4 as its vertices and click ok.
- Again, the next two clicks on points C and B.
- Enter 4 as its vertices and click ok.
- Similarly, the next two clicks on points B and A.
- Enter 4 as its vertices and click ok.



Step 3 Measures the Areas

- Select the Area tool, click on three squares
- The value of the area of the squares will appear



Step 4 Compare the values

- Compare the values of the area of the square ACDE ($\frac{1}{2} b^2$) + the area of the square CBFG ($\frac{1}{2} a^2$) and the area of the square BAHI ($\frac{1}{2} c^2$)
- We should verify that $\frac{1}{2} b^2 + \frac{1}{2} a^2 = \frac{1}{2} c^2$ (10+15=25)

Student Activity:

1. Students open GeoGebra and Create this applet
2. Drag or move the point C, and visually observe the Pythagoras theorem.

Conclusion:

- Recap all the tools learned in the class.
- Encourage the students to list out the applications of Pythagoras theorem in real life.