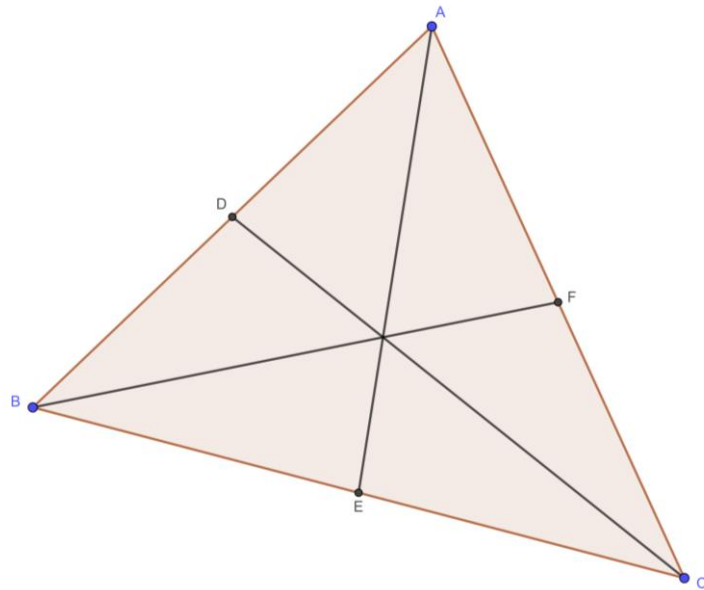







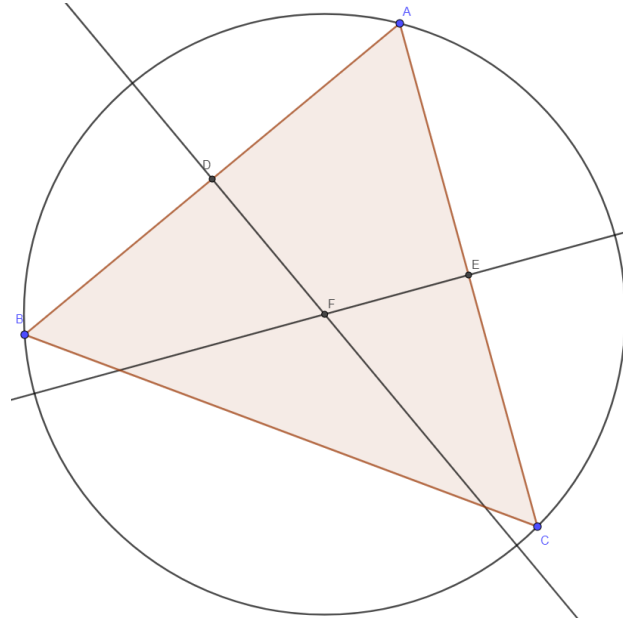
**Task A: Centres of Triangle - Centroid**







Create objects on the Graphics window as follows:


Steps	Objects to be created	Action
1.	3 distinct points, $A$ , $B$ and $C$	<ul style="list-style-type: none"> <li>◆ Select  “Point”</li> </ul>
2.	Form triangle $ABC$	<ul style="list-style-type: none"> <li>◆ Select  “Polygon”</li> <li>◆ Click on the Graphics window at <math>A</math>, <math>B</math> and <math>C</math> in anti-clockwise direction and then back to the first point</li> </ul>
3.	Medians $AE$ , $BF$ and $CD$	<ul style="list-style-type: none"> <li>◆ Select  “Midpoint or Centre”</li> <li>◆ Click on segments <math>AB</math>, <math>BC</math> and <math>CA</math> to create the mid-points of the three sides</li> <li>◆ Select  “Segment”</li> <li>◆ Click on points <math>A</math> and <math>E</math>, <math>B</math> and <math>F</math>, <math>C</math> and <math>D</math> to create the medians</li> </ul>
4.	Centroid $G$	<p>Centroid:</p> <ul style="list-style-type: none"> <li>◆ Select  “Intersect”</li> <li>◆ Click on the intersection point of any two medians (<math>AE</math>, <math>BF</math> and <math>CD</math>)</li> </ul>

**Task B: Centres of Triangle – Circumcentre**

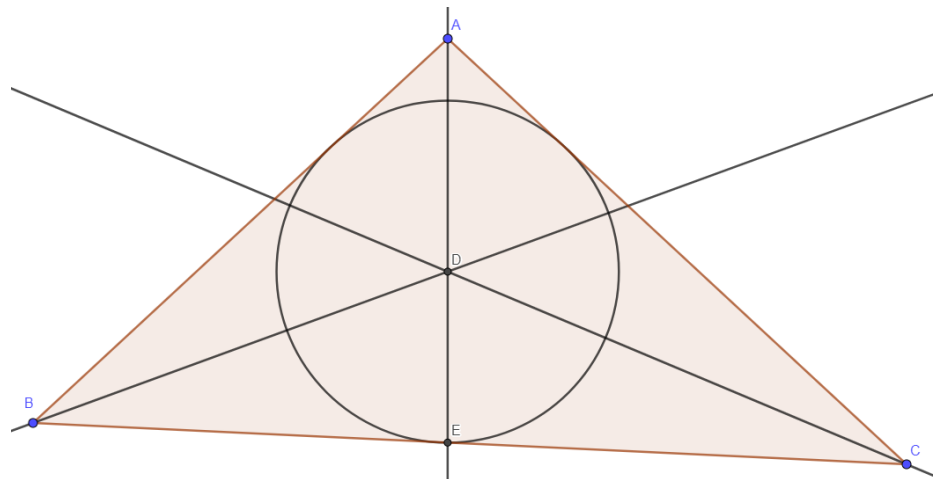


Create objects on the Graphics window as follows:




Steps	Objects to be created	Action
1.	3 distinct points, $A$ , $B$ and $C$	<ul style="list-style-type: none"> <li>◆ Select  “Point”</li> </ul>
2.	Form triangle $ABC$	<ul style="list-style-type: none"> <li>◆ Select  “Polygon”</li> <li>◆ Click on the Graphics window at <math>A</math>, <math>B</math> and <math>C</math> in anti-clockwise direction and then back to the first point</li> </ul>
3.	Mid-point $D$ and $E$	<ul style="list-style-type: none"> <li>◆ Select  “Midpoint or Centre”</li> <li>◆ Click on segments <math>AB</math> and <math>CA</math> to create the mid-points of the two sides</li> <li>◆</li> </ul>
4.	Perpendicular bisector $AB$ and $CA$	<ul style="list-style-type: none"> <li>◆ Select  “Perpendicular Line”</li> <li>◆ Click on the points <math>D</math> and line <math>AB</math> to create the perpendicular bisector of <math>AB</math></li> <li>◆ Click on the points <math>E</math> and line <math>CA</math> to create the perpendicular bisector of <math>CA</math></li> </ul>




Steps	Objects to be created	Action
5.	Circumcentre $F$	Centroid: ♦ Select  “Intersect” ♦ Click on the intersection point of the two perpendicular bisectors

**Task C: Centres of Triangle – In-centre**

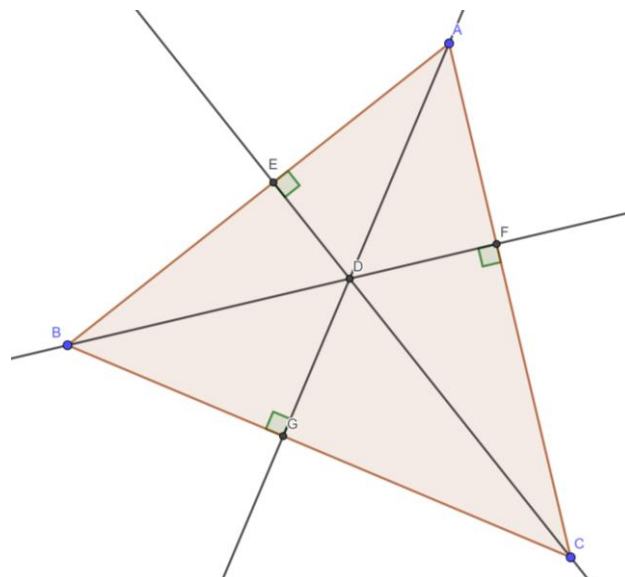


Create objects on the Graphics window as follows:



Steps	Objects to be created	Action
1.	3 distinct points, $A$ , $B$ and $C$	♦ Select  “Point”
2.	Form triangle $ABC$	♦ Select  “Polygon” ♦ Click on the Graphics window at $A$ , $B$ and $C$ in anti-clockwise direction and then back to the first point
3.	Angle bisectors of $\angle ABC$ , $\angle BCA$ and $\angle CAB$	♦ Select  “Angle Bisector” ♦ Click on points $A$ , $B$ and $C$ (in anti-clockwise order) to create the angle bisector of $\angle ABC$ ♦ Click on points $C$ , $C$ and $A$ (in anti-clockwise order) to create the angle bisector of $\angle BCA$ ♦ Click on points $C$ , $A$ and $B$ (in anti-clockwise order) to create the angle bisector of $\angle CAB$



Steps	Objects to be created	Action
4.	Intersection of any two angle bisectors	<ul style="list-style-type: none"> <li>◆ Select  “Intersect”</li> <li>◆ Click on the intersection point of any two angle bisectors</li> </ul>
5.	From $D$ , draw a line perpendicular to $BC$	<ul style="list-style-type: none"> <li>◆ Select  “Perpendicular Line”</li> <li>◆ Click at point <math>D</math> and then segment <math>BC</math> to create the line passing through <math>D</math> and perpendicular to <math>BC</math></li> </ul>
6.	The circle	<ul style="list-style-type: none"> <li>◆ Select  “Circle with Centre through Point”</li> <li>◆ Click at points <math>D</math> and <math>E</math> and done</li> </ul>

**Task D: Centres of Triangle – Ortho-centre**



Create objects on the Graphics window as follows:

Steps	Objects to be created	Action
1.	3 distinct points, $A$ , $B$ and $C$	<ul style="list-style-type: none"> <li>◆ Select  “Point”</li> </ul>
2.	Form triangle $ABC$	<ul style="list-style-type: none"> <li>◆ Select  “Polygon”</li> <li>◆ Click on the Graphics window at <math>A</math>, <math>B</math> and <math>C</math> in anti-clockwise direction and then back to the first point</li> </ul>

Steps	Objects to be created	Action
3.	Altitudes $AG$ , $BF$ and $CE$	<ul style="list-style-type: none"> <li>◆ Select  “Perpendicular Line”</li> <li>◆ Click at point <math>A</math> and then segment <math>BC</math> to create the line passing through <math>A</math> and perpendicular to <math>BC</math></li> <li>◆ Click at point <math>B</math> and then segment <math>CA</math> to create the line passing through <math>B</math> and perpendicular to <math>CA</math></li> <li>◆ Click at point <math>C</math> and then segment <math>AB</math> to create the line passing through <math>C</math> and perpendicular to <math>AB</math></li> </ul>
4.	Ortho-centre	<ul style="list-style-type: none"> <li>◆ Select  “Intersect”</li> <li>◆ Click on the any two perpendicular lines (<math>AG</math>, <math>BF</math> and <math>CE</math>)</li> </ul>

### Exercises

#### Task E: Angle in a semi-circle

To show that any angle in a semi-circle is a right angle.

#### Task F: Angle in a semi-circle

To show that for a right-angled triangle  $ABC$ , one can always draw a circle with diameter  $AC$  and passes through  $B$ .

#### Task G: Tangent to a circle from an external point

To construct the two tangents from an external point to a given circle.