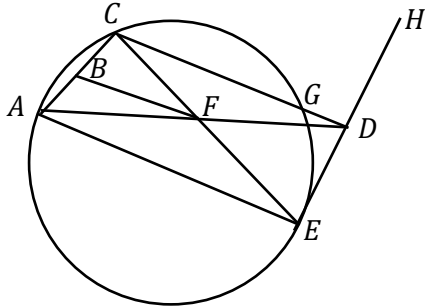
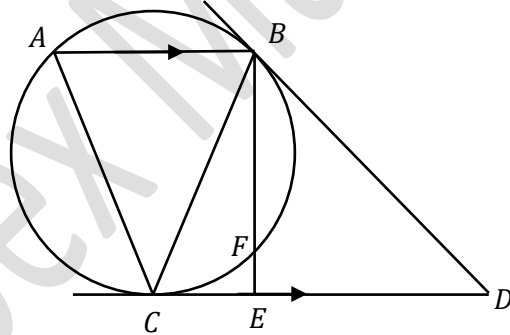


(11) Plane Geometry

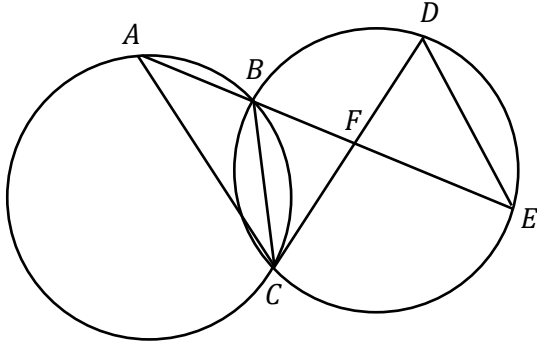
1. In the figure (not drawn to scale), AE is the diameter of the circle, F is the mid-point of CE and ED is tangent to the circle at E . CG , BF and AE are parallel lines.
 - a) Prove that $\triangle ACE$ is congruent to $\triangle EDC$
 - b) Prove that $\triangle CBF$ is similar to $\triangle DEC$
 - c) Prove that $CD \times CE = 4CF \times BF$
 - d) Prove that $AE^2 = CA^2 + CD^2 + DE^2$



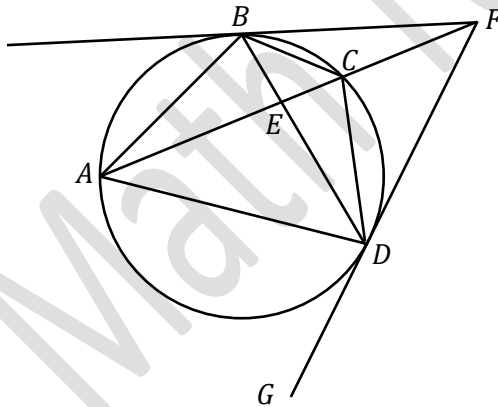
2. In the figure, BD and CD are tangents to the circle at B and C respectively. AB is parallel to CD and BE is perpendicular to CD .
 - a) Prove that $\triangle ABC$ is an isosceles triangle
 - b) Prove that $\triangle DCB$ is similar to $\triangle CAB$
 - c) Prove that $CE^2 + EB^2 = AB \times DB$



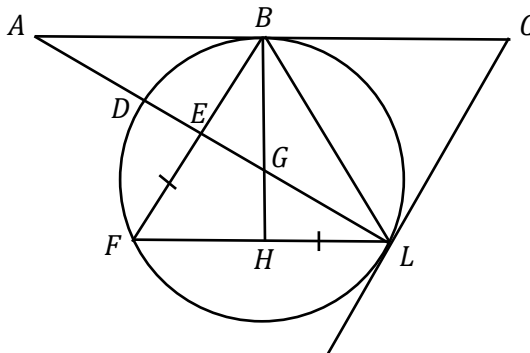
3. In the diagram, CD is a tangent to the circle ABC at C . BC is a common chord between both circles and F is the intersection between lines AE and CD .
- Prove that AC is parallel to DE .
 - Prove that $CF^2 = AF \times FB$



4. In the diagram, BD and DF are tangents to the circle and $\angle ABD = 2\angle DBC$. Prove that $AD = DF$.

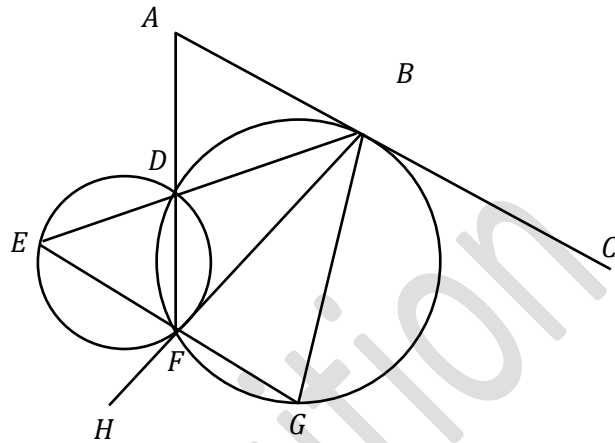


5. BCF is an equilateral triangle inscribed in a circle. ABC is a tangent to the circle at point B . Given that $EF = HL$ and $AEGL$ is a straight line, prove that

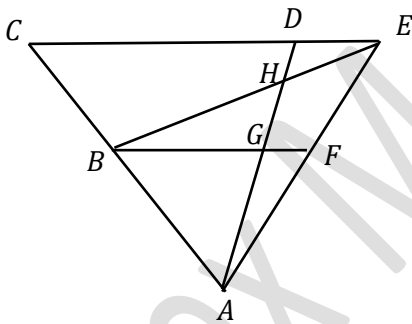


6. In the diagram, the 2 circles intersect at points D and F . ABC is a tangent to the bigger circle at B and HFB is a tangent to the smaller circle at F . ADF , EDB and EFG are straight lines.

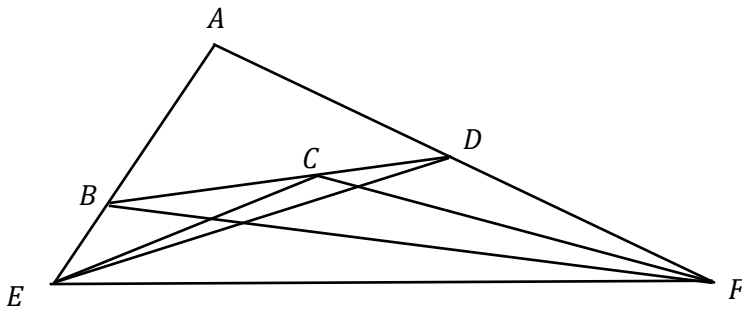
- a) Prove that $BF = BG$.
 b) Show that ABC is parallel to EFG
 c) Show that $\triangle BDA$ is similar to $\triangle EGB$



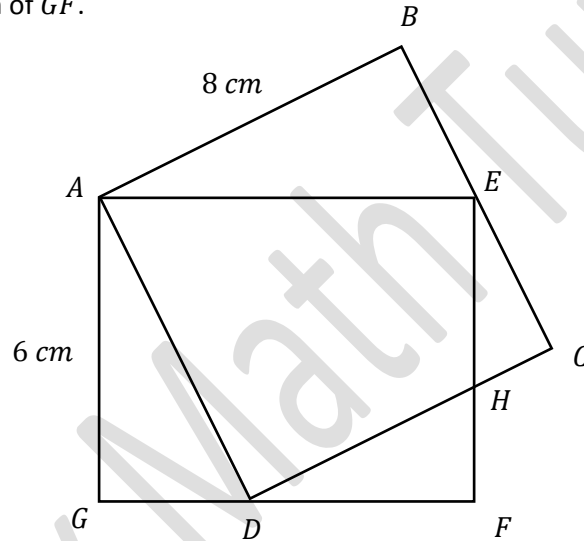
7. In the diagram, B is the mid-point of AC and G is the midpoint of AD . CDE and BGF are straight lines. Given that $BH = 2HE$, show that,
 a) $\triangle DHE$ is similar to $\triangle GHB$
 b) $AH = 5DH$



8. The diagram shows triangle AEF where $AD = DF$, $AB = 2BE$ and $BC = 3CD$. Find the value of $\frac{\text{Area of } \triangle CDE}{\text{Area of } \triangle AEF}$.



9. In the figure, $ABCD$ is a square with sides 8 cm and $AEFG$ is a rectangle. Given that $AG = 6\text{ cm}$, find the length of GF .



10. In the diagram, AFE is a triangle inscribed in a circle. $ABCD$ is a parallelogram and AB is a tangent to the circle at point A . Prove that

