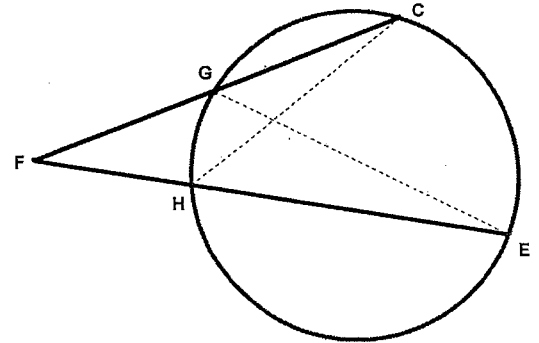


## Circles

### Question 1

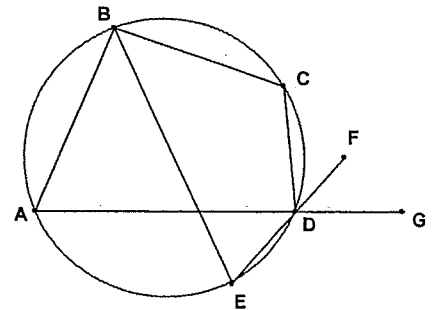
The point  $F$  lies outside the circle and the points  $C$  and  $E$  lie on the circumference of the circle.  $FC$  and  $FE$  cross the circle at  $G$  and  $H$  respectively.



By using similar triangle, or otherwise, show that:  
 $FC \times FG = FE \times FH$

### Question 2

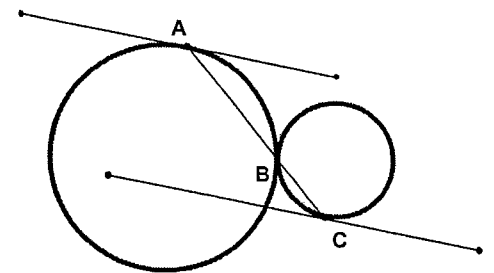
$ABCD$  is a cyclic quadrilateral.  $BE$  bisects the angle  $ABC$  and crosses the circle at  $E$ . Show that the line passing through  $ED$  bisects the angle  $CDG$



### Question 3

Two circles touch at point  $B$ . Through the point  $B$  a line is drawn which cuts the two circles at  $A$  and  $C$ . Tangents to the circles are drawn at  $A$  and  $C$ . Show that the two tangents are parallel.

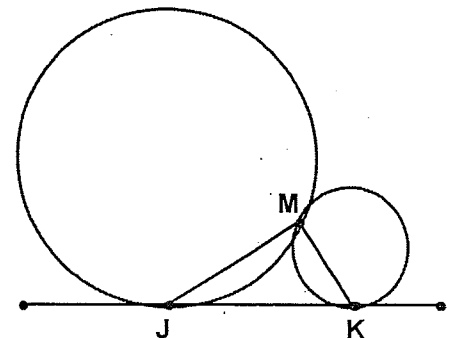
[Hint: draw the common tangent at  $B$ ]



### Question 4

Two circles touch each other at the point  $M$ .  $JK$  is a common tangent to both circles as shown.

Prove that  $JM$  and  $KM$  are perpendicular.  
 [Hint: draw the tangent to both circles at  $M$ ]

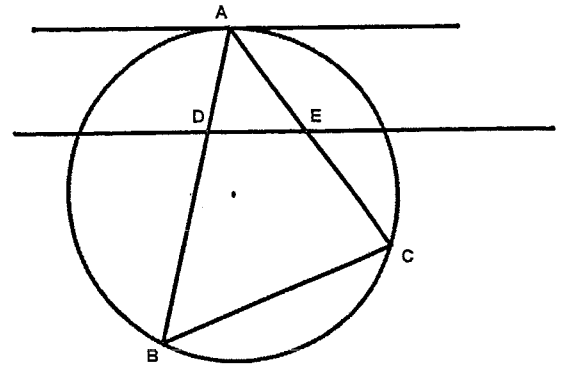


### Question 5

The vertices of the triangle ABC lie on the circle, as shown in the diagram.

Through the point A a tangent is drawn.

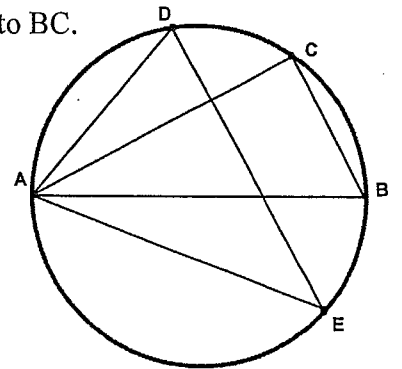
A parallel line to the tangent cuts the triangle ABC at points D and E. Show that BCED is a cyclic quadrilateral.



### Question 6

The vertices of triangle ABC lie on the circumference of a circle. The points D and E are on the circle such that DE is parallel to BC.

Show that:  $\angle DAC = \angle BAE$



### Question 7

The vertices of triangle ABC lie on the circumference of the circle. AE and BD are perpendicular to the BC and AC respectively. (The points D and E lie on the circle).

Show that  $DC=EC$

