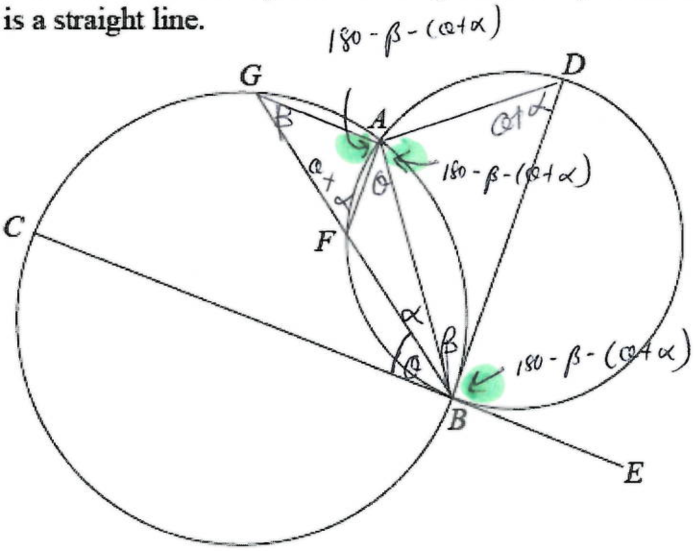
In the diagram, BC and BD are chords (not necessarily diameters) of one circle and tangents of the other. BFG is a straight line.



(i) Prove that $\angle CBA = \angle GFA$ **2**

(ii) Prove that $\angle EBD = \angle FAG$ **2**

(i) let $\angle CBF = \theta$, $\angle FBA = \alpha$

$\therefore \angle FAB = \theta$ (alternate segment theorem)

$\therefore \angle GFA = \theta + \alpha$ (exterior $\angle$ of a $\triangle$ is $=$ to the opposite interior $\angle$)

$\angle CBA = \angle CBF + \angle FBA$

$= \theta + \alpha$

$= \angle GFA$

(ii) let $\angle ABD = \beta$

$\therefore \angle BGA = \beta$ (alternate segment theorem)

$\angle G\cancel{}FA = \angle ADB = \theta + \alpha$ (the exterior $\angle$ of a cyclic quadrilateral is $=$ to the opposite interior $\angle$)

$\therefore \angle GAF = 180 - (\beta) - (\theta + \alpha)$ (angle sum of a $\triangle$)

similarly $\angle BAD = 180 - \beta - (\theta + \alpha)$

$\angle BAD = \angle DBE$ (alternate segment theorem)