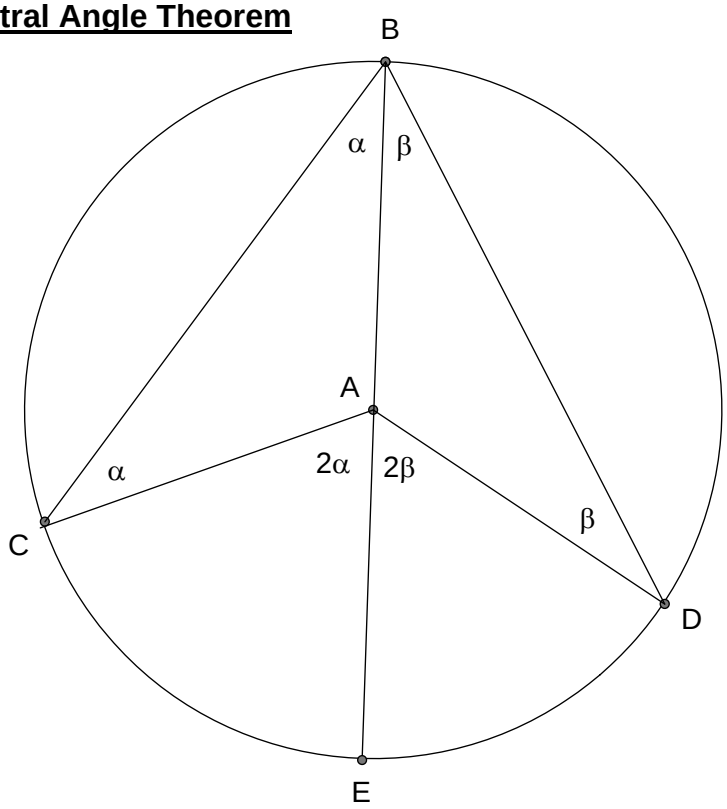
Year 10 Mathematics Extension Investigation

Circle Geometry Properties!!! Take Home Part Solution 2 of 7

TASK TWO: Central Angle Theorem



Given: Circle centre A. ∠CBD is the angle subtended at the circumference and ∠CAD is the angle subtended at the centre by the arc CD

To Prove: ∠CAD = 2 x ∠CBD

Extension to the diagram: Join BA and produce it to E.

Proof:

	∠ABC = ∠ACB = α	ΔABC is isosceles
	∠ABD = ∠ADB = β	ΔABD is isosceles
	∠EAC = 2α	Ext. ∠ of ΔABC
	∠EAD = 2β	Ext. ∠ of ΔABD
	∠CBD = ∠CBA + ∠ABD	
∴	∠CBD = $\alpha + \beta$	
	∠CAD = ∠EAC + ∠EAD	
∴	∠CAD = $2\alpha + 2\beta$	
∴	∠CAD = $2(\alpha + \beta)$	
∴	∠CAD = 2 x ∠CBD	

Q.E.D.