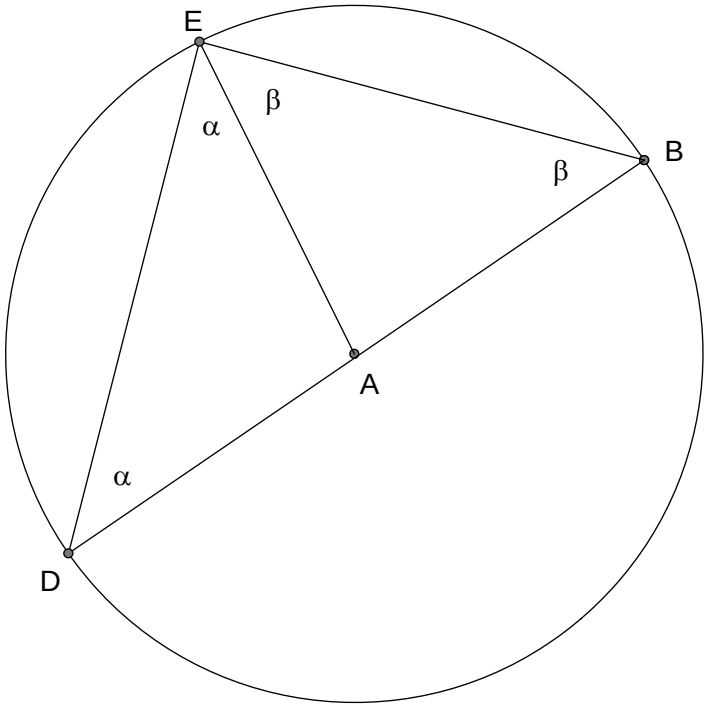
Year 10 Mathematics Extension Investigation

Circle Geometry Properties!!! Take Home Part Solution 1 of 7

TASK ONE: Angle in a Semi-Circle Theorem



Given: Circle centre A, diameter BD. ∠BED is any angle in the semi-circle DBE.

To Prove: The angle in a semi-circle is a right angle.

Extension to the diagram: Draw AE.

Proof:

	$\angle AED = \angle ADE = \alpha$	ΔADE is isosceles
	$\angle AEB = \angle ABE = \beta$	ΔABE is isosceles
	$\angle BAE = 2\alpha$	Ext. $\angle$ of ΔAED
	$\angle DAE = 2\beta$	Ext. $\angle$ of ΔAEB
	$\angle BAE + \angle DAE = 180°$	Straight angle
$\therefore$	$2\alpha + 2\beta = 180°$	
$\therefore$	$\alpha + \beta = 90°$	
$\therefore$	$\angle BED = 90°$	
		Q.E.D.