

Cyclic Hexagon - Alternate Angle Sums with GeoGebra

by Michael de Villiers, 25 June 2023

Here are some screen grabs of different alternate angle sum measurements of a cyclic hexagon using *GeoGebra Classic 6* - Fig 5 shows an example where the two sums of alternate angles are not equal.

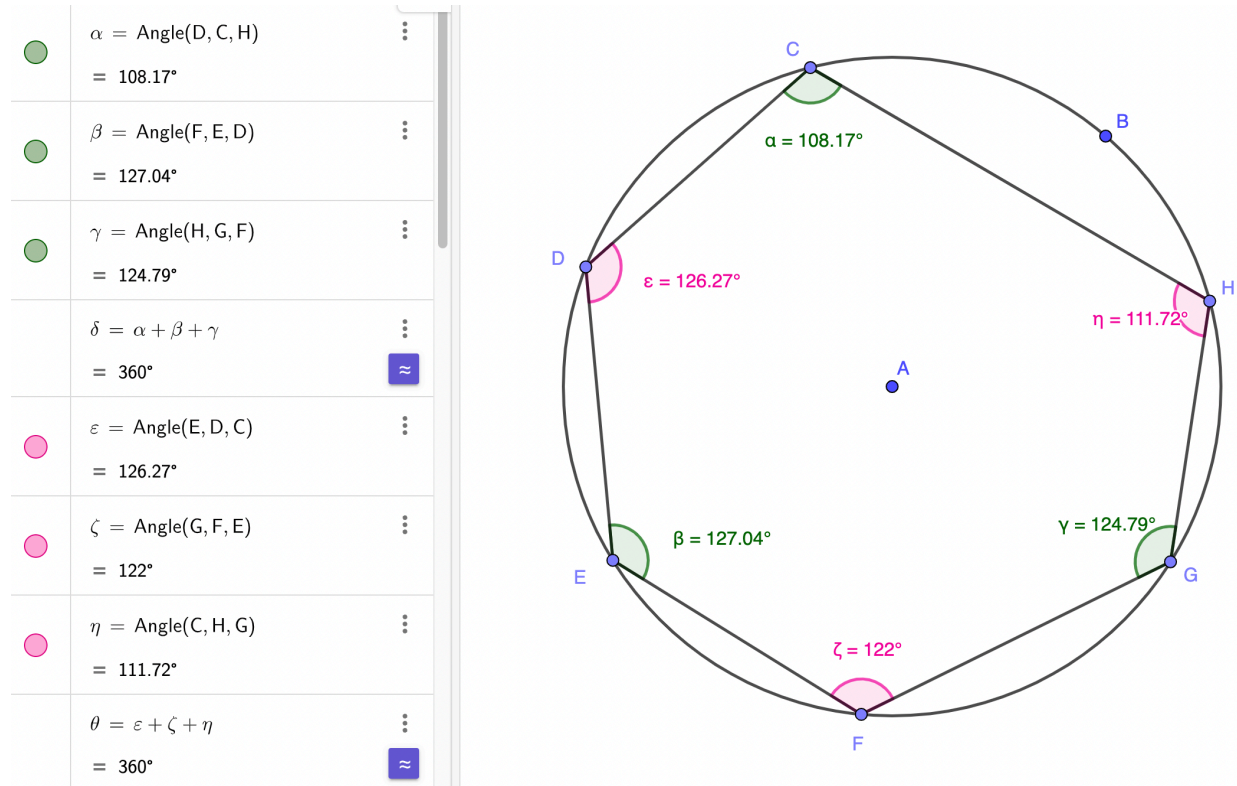


Fig 1 Convex case - sum of alternate angles = 360°

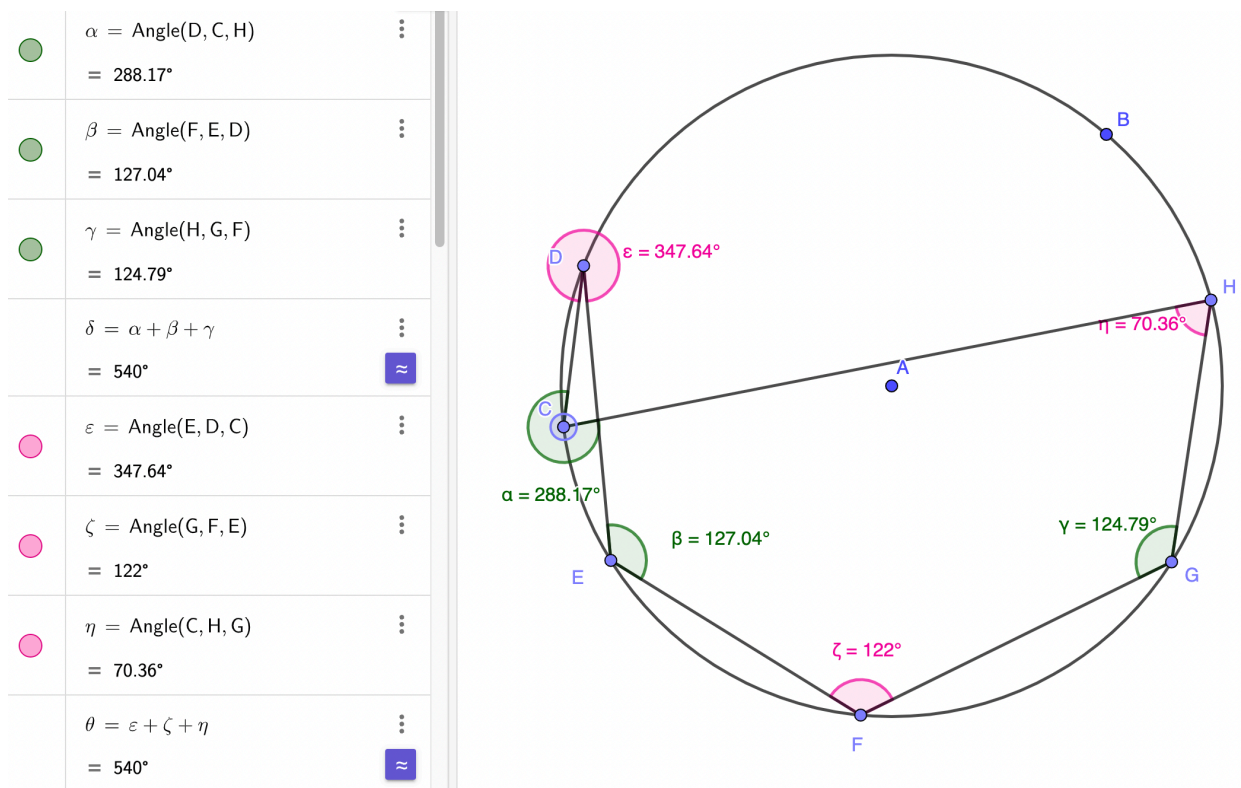


Fig 2 Crossed case 1 - sum of alternate angles = 540°

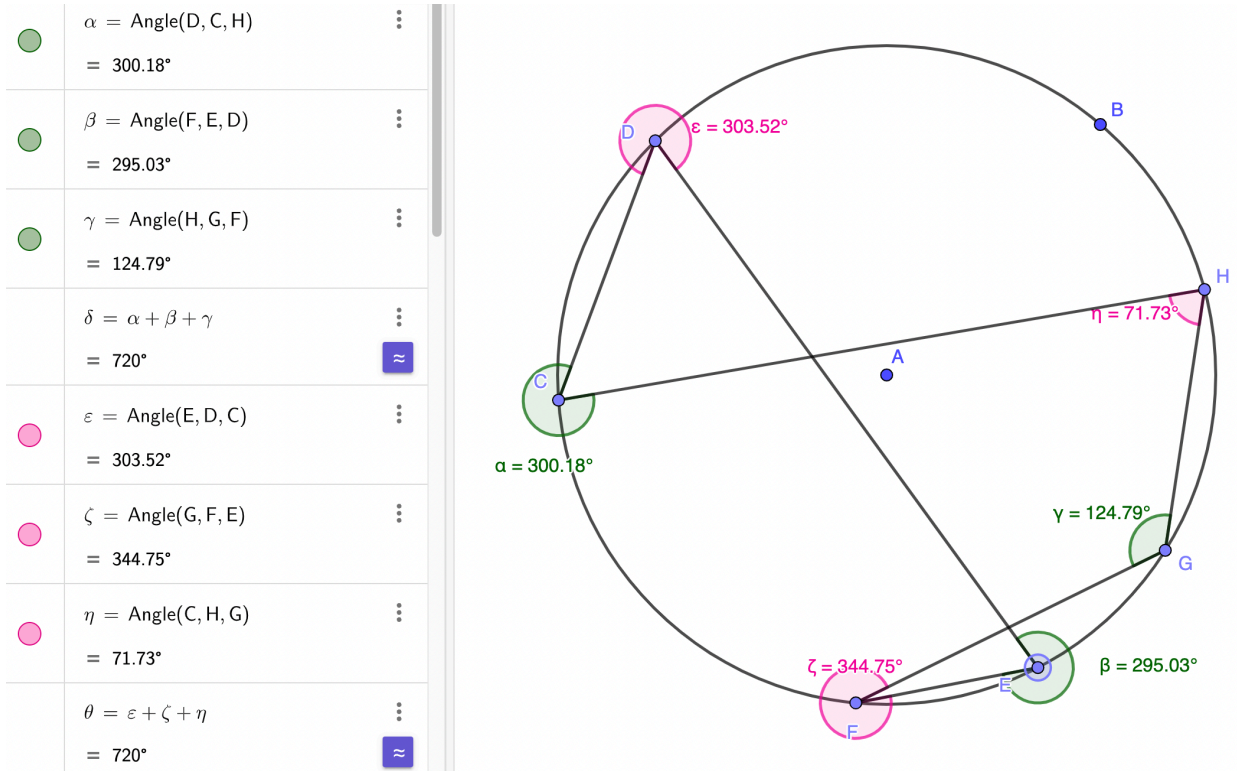


Fig 3 Crossed case 2 - sum of alternate angles = 720°

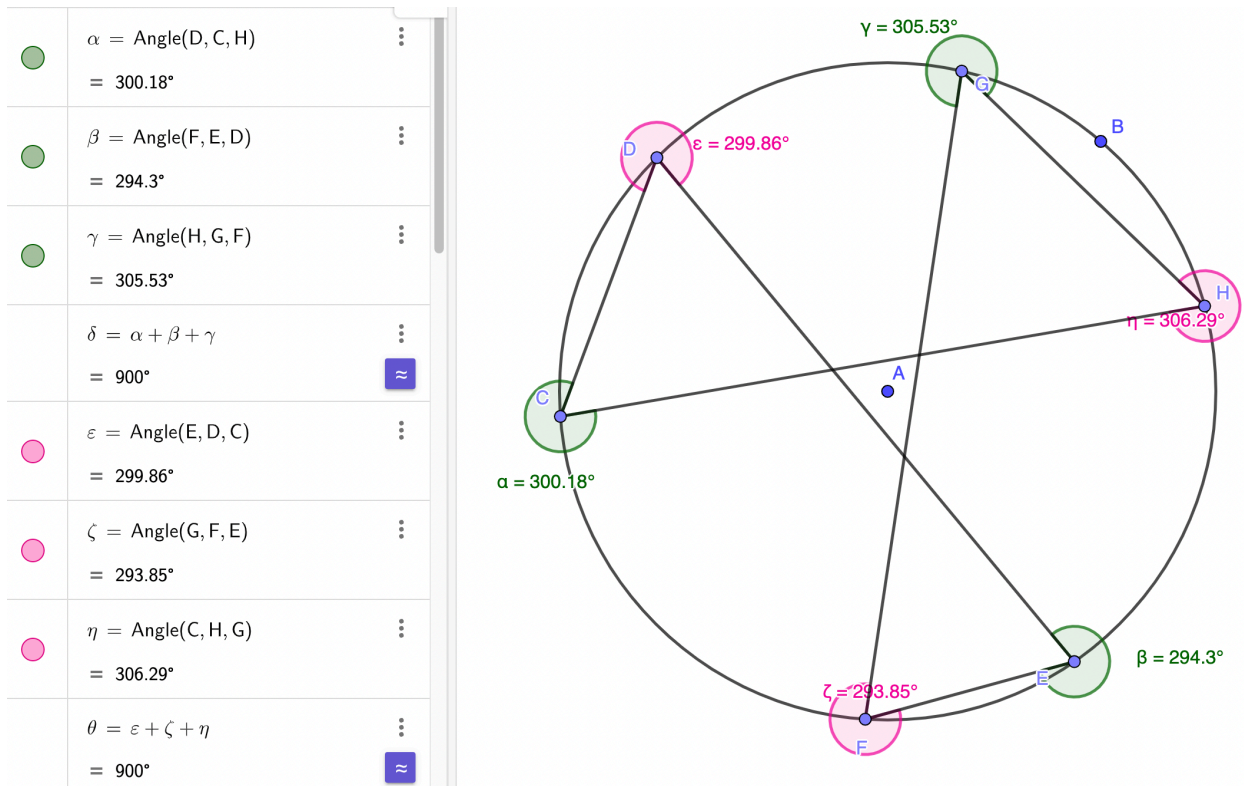










Fig 4 Crossed case 3 - sum of alternate angles = 900°

	$\alpha = \text{Angle}(D, C, H)$ = 300.18°	⋮
	$\beta = \text{Angle}(F, E, D)$ = 115.03°	⋮
	$\gamma = \text{Angle}(H, G, F)$ = 124.79°	⋮
	$\delta = \alpha + \beta + \gamma$ = 540° not equal to 180° below	⋮ 
	$\varepsilon = \text{Angle}(E, D, C)$ = 19.91°	⋮
	$\zeta = \text{Angle}(G, F, E)$ = 103.61°	⋮
	$\eta = \text{Angle}(C, H, G)$ = 56.48°	⋮
	$\theta = \varepsilon + \zeta + \eta$ = 180° not equal to 540° above	⋮ 

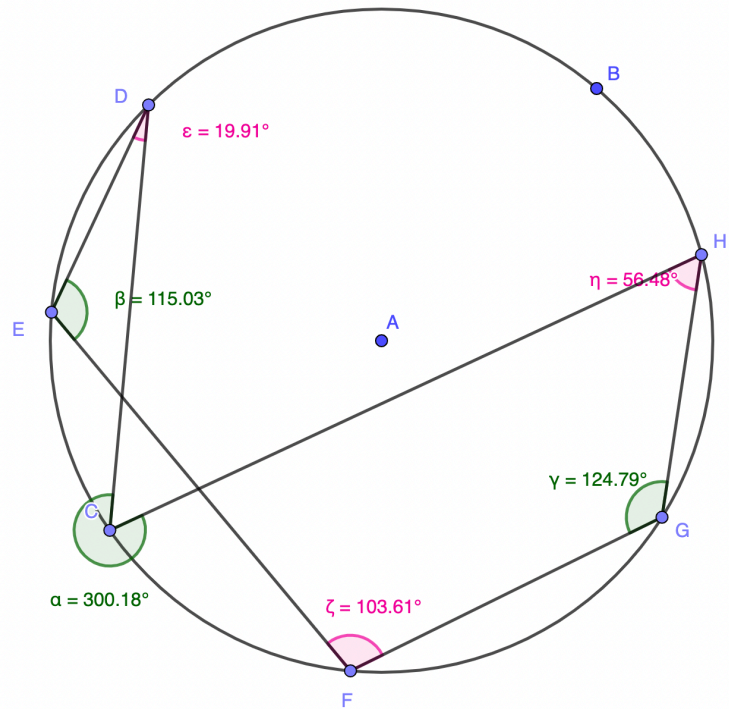


Fig 5 Crossed case 4 - sum of alternate angles **not equal: 540° ≠ 180°**