

3.14 Cyclic Quadrilateral

Sides of a quadrilateral: a, b, c, d

Diagonals: d_1, d_2

Angle between the diagonals: φ

Internal angles: $\alpha, \beta, \gamma, \delta$

Radius of circumscribed circle: R

Perimeter: L

Semiperimeter: p

Area: S

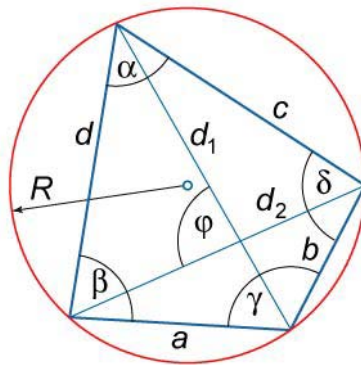


Figure 25.

237. $\alpha + \gamma = \beta + \delta = 180^\circ$

238. Ptolemy's Theorem
 $ac + bd = d_1 d_2$

239. $L = a + b + c + d$

240.
$$R = \frac{1}{4} \sqrt{\frac{(ac + bd)(ad + bc)(ab + cd)}{(p - a)(p - b)(p - c)(p - d)}}$$

where $p = \frac{L}{2}$.

241.
$$S = \frac{1}{2} d_1 d_2 \sin \varphi,$$

$$S = \sqrt{(p - a)(p - b)(p - c)(p - d)},$$

where $p = \frac{L}{2}$.