**Cyclic Quadrilaterals**

The sum of the angles at opposite vertices of a cyclic quadrilateral is 180 degrees. This is the same for all cyclic quadrilaterals, regardless of the positioning of the centre dot. For example:

* On a circle with nine points;

*b*



* On a circle with twelve points;



* On a circle with fifteen points;



* On a circle with eighteen points;



These results show that the sum of angles on opposite vertices of a cyclic quadrilateral equals 180˚, even when the centre dot is not inside the quadrilateral. Proof of this can be seen in diagrams 2, 4, 6 and 8.

In diagram 1, *a* (80˚) + *d* (100˚) =180˚ and *b* (80˚) + *c* (100˚) = 180˚.

In diagram 2 (the centre dot isn’t in the quadrilateral) *a* (60˚) + *c* (120˚) =180˚ and *b* (140˚) + *d* (40˚) =180˚.

In diagram 3, *a* (60˚) + *c* (120˚) =180˚ and *b* (90˚) + *d* (90˚) = 180˚.

In diagram 4 (the centre dot isn’t in the quadrilateral) *a* (45˚) + *c* (135˚) =180˚ and *b* (150˚) + *d* (30˚) =180˚.

In diagram 5, *a* (60˚) + *c* (120˚) =180˚ and *b* (132˚) + *d* (48˚) = 180˚.

In diagram 6 (the centre dot isn’t in the quadrilateral) *a* (36˚) + *c* (144˚) =180˚ and *b* (132˚) + *d* (48˚) =180˚.

In diagram 7, *a* (60˚) + *c* (120˚) =180˚ and *b* (130˚) + *d* (50˚) = 180˚.

In diagram 8 (the centre dot isn’t in the quadrilateral) *a* (60˚) + *c* (120˚) =180˚ and *b* (140˚) + *d* (40˚) =180˚.