

into two parts; ADB and CDB are similar segments of circles, having the common chord BD ; CD and AD are produced to meet the circumferences at F and E respectively, and AF , CE , BF , BE are joined: shew that ABF and CBE are isosceles triangles, equiangular to one another.

525. If the centres of two circles which touch each other externally be fixed, the common tangent of those circles will touch another circle of which the straight line joining the fixed centres is the diameter.

526. A is a given point: it is required to draw from A two straight lines which shall contain a given angle and intercept on a given straight line a part of given length.

527. A straight line and two circles are given: find the point in the straight line from which the tangents drawn to the circles are of equal length.

528. In a circle two chords of given length are drawn so as not to intersect, and one of them is fixed in position; the opposite extremities of the chords are joined by straight lines intersecting within the circle: shew that the locus of the point of intersection will be a portion of the circumference of a circle, passing through the extremities of the fixed chord.

529. A and B are the centres of two circles which touch internally at C , and also touch a third circle, whose centre is D , externally and internally respectively at E and F : shew that the angle ADB is double of the angle ECF .

530. C is the centre of a circle, and CP is a perpendicular on a chord APB : shew that the sum of CP and AP is greatest when CP is equal to AP .

531. AB , BC , CD are three adjacent sides of any polygon inscribed in a circle; the arcs AB , BC , CD are bisected at L , M , N ; and LM cuts BA , BC respectively at P and Q : shew that BPQ is an isosceles triangle; and that the angles ABC , BCD are together double of the angle LMN .

532. In the circumference of a given circle determine a point so situated that if chords be drawn to it from the extremities of a given chord of the circle their difference shall be equal to a given straight line less than the given chord.

533. Construct a triangle, having given the sum of the