

square on the side opposite to the obtuse angle is greater than the sum of the squares on the sides containing it, by the rectangle of the sides.

501. Construct a rectangle equal to a given square when the sum of two adjacent sides of the rectangle is equal to a given quantity.

502. Construct a rectangle equal to a given square when the difference of two adjacent sides of the rectangle is equal to a given quantity.

503. The least square which can be inscribed in a given square is that which is half of the given square.

504. Divide a given straight line into two parts so that the squares on the whole line and on one of the parts may be together double of the square on the other part.

505. Two rectangles have equal areas and equal perimeters: shew that they are equal in all respects.

506. $ABCD$ is a rectangle; P is a point such that the sum of PA and PC is equal to the sum of PB and PD : shew that the locus of P consists of the two straight lines through the centre of the rectangle parallel to its sides.

III. 1 to 37.

507. Describe a circle which shall pass through a given point and touch a given straight line at a given point.

508. Describe a circle which shall pass through a given point and touch a given circle at a given point.

509. Describe a circle which shall touch a given circle at a given point and touch a given straight line.

510. AD , BE are perpendiculars from the angles A and B of a triangle on the opposite sides; BF is perpendicular to ED or ED produced: shew that the angle FBD is equal to the angle EBA .

511. If ABC be a triangle, and BE , CF the perpendiculars from the angles on the opposite sides, and K the middle point of the third side, shew that the angles FEK , EKF are each equal to A .

512. AB is a diameter of a circle; AC and AD are two chords meeting the tangent at B at E and F respectively: shew that the angles FCE and FDE are equal.