

402. A square is inscribed in a right-angled triangle ABC , one side DE of the square coinciding with the hypotenuse AB of the triangle: shew that the area of the square is equal to the rectangle AD, BE .

403. $ABCD$ is a parallelogram; from B a straight line is drawn cutting the diagonal AC at F , the side DC at G , and the side AD produced at E : shew that the rectangle EF, FG is equal to the square on BF .

404. If a straight line drawn from the vertex of an isosceles triangle to the base, be produced to meet the circumference of a circle described about the triangle, the rectangle contained by the whole line so produced, and the part of it between the vertex and the base shall be equal to the square on either of the equal sides of the triangle.

405. Two straight lines are drawn from a point A to touch a circle of which the centre is E ; the points of contact are joined by a straight line which cuts EA at H ; and on HA as diameter a circle is described: shew that the straight lines drawn through E to touch this circle will meet it on the circumference of the given circle.

VI. 19 to D .

406. An isosceles triangle is described having each of the angles at the base double of the third angle: if the angles at the base be bisected, and the points where the lines bisecting them meet the opposite sides be joined, the triangle will be divided into two parts in the proportion of the base to the side of the triangle.

407. Any regular polygon inscribed in a circle is a mean proportional between the inscribed and circumscribed regular polygons of half the number of sides.

408. In the figure of VI. 24 shew that EG and KH are parallel.

409. Divide a triangle into two equal parts by a straight line at right angles to one of the sides.

410. If two isosceles triangles are to one another in the duplicate ratio of their bases, shew that the triangles are similar.