

are drawn and produced to cut the circle at F and G : shew that the quadrilateral $CFDG$ has any two of its adjacent sides in the same ratio as the remaining two.

354. Apply VI. 3 to solve the problem of the trisection of a finite straight line.

355. In the circumference of the circle of which AB is a diameter, take any point P ; and draw PC , PD on opposite sides of AP , and equally inclined to it, meeting AB at C and D : shew that AC is to BC as AD is to BD .

356. AB is a straight line, and D is any point in it: determine a point P in AB produced such that PA is to PB as DA is to DB .

357. From the same point A straight lines are drawn making the angles BAC , CAD , DAE each equal to half a right angle, and they are cut by a straight line $BCDE$, which makes BAE an isosceles triangle: shew that BC or DE is a mean proportional between BE and CD .

358. The angle A of a triangle ABC is bisected by AD which cuts the base at D , and O is the middle point of BC : shew that OD bears the same ratio to OB that the difference of the sides bears to their sum.

359. AD and AE bisect the interior and exterior angles at A of a triangle ABC , and meet the base at D and E ; and O is the middle point of BC : shew that OB is a mean proportional between OD and OE .

360. Three points D , E , F in the sides of a triangle ABC being joined form a second triangle, such that any two sides make equal angles with the side of the former at which they meet: shew that AD , BE , CF are at right angles to BC , CA , AB respectively.

VI. 4 to 6.

361. If two triangles be on equal bases and between the same parallels, any straight line parallel to their bases will cut off equal areas from the two triangles.

362. AB and CD are two parallel straight lines; E is the middle point of CD ; AC and BE meet at F , and AE and BD meet at G : shew that FG is parallel to AB .

363. A , B , C are three fixed points in a straight line; any straight line is drawn through C ; shew that the perpendiculars on it from A and B are in a constant ratio.