

411. Through a given point draw a chord in a given circle so that it shall be divided at the point in a given ratio.

412. From a point without a circle draw a straight line cutting the circle, so that the two segments shall be equal to each other.

413. In the figure of II. 11 shew that four other straight lines, besides the given straight line are divided in the required manner.

414. Construct a triangle, having given the base, the vertical angle, and the rectangle contained by the sides.

415. A circle is described round an equilateral triangle, and from any point in the circumference straight lines are drawn to the angular points of the triangle: shew that one of these straight lines is equal to the other two together.

416. From the extremities B, C of the base of an isosceles triangle ABC , straight lines are drawn at right angles to AB, AC respectively, and intersecting at D : shew that the rectangle BC, AD is double of the rectangle AB, DB .

417. ABC is an isosceles triangle, the side AB being equal to AC ; F is the middle point of BC ; on any straight line through A perpendiculars FG and CE are drawn: shew that the rectangle AC, EF is equal to the sum of the rectangles FC, EG and FA, FG .

XI. 1 to 12.

418. Shew that equal straight lines drawn from a given point to a given plane are equally inclined to the plane.

419. If two straight lines in one plane be equally inclined to another plane, they will be equally inclined to the common section of these planes.

420. From a point A a perpendicular is drawn to a plane meeting it at B ; from B a perpendicular is drawn on a straight line in the plane meeting it at C : shew that AC is perpendicular to the straight line in the plane.

421. ABC is a triangle; the perpendiculars from A and B on the opposite sides meet at D ; through D a straight line is drawn perpendicular to the plane of the triangle, and E is any point in this straight line: shew that

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