

6. The sides about the equal angles of equiangular triangles are proportional. (Euc. VI. 4, in part.)⁸

ABC is an isosceles triangle having $AB = BC$, and AD perpendicular upon BC . Prove that the square on AC is equal in area to twice the rectangle contained by BC and CD .

PROBLEMS.—Honors.

PROFESSOR DUPUIS, EXAMINER.

1. Show that with any three numbers, if each be multiplied by the difference between the other two, one product is equal to the sum of the other two. And the product having the middle number as one of its factors is always the greatest.

2. In a right-angled triangle the line from the right angle to the middle of the hypotenuse is r times one of the sides. Find the ratio of the sides.

3. Three circles each touch two non-parallel lines, and the middle circle touches each of the others. Show that the square on the diameter of the middle circle is equal in area to the rectangle contained by the diameters of the other two.

4. R is a point on the circumference of a circle whose centre is C , and P, Q are points upon a line through the centre, and upon the same side of the centre. If $CP \cdot CQ = CR^2$ show that

$$CP : CQ = PR^2 : QR^2.$$

5. AA_1, BB_1 are the diagonals of a square. P is a point on AB_1 and P_1 is a point on B_1A_1 produced. If P and P_1 move so as to keep the area of the triangle PBP_1 constant, show that the area of the rectangle $AP \cdot A_1P_1$ is constant.

6. The difference between the squares of two adjacent sides of any parallelogram is equal to the product of the diagonals multiplied by the cosine of the angle between the diagonals.

ENGLISH GRAMMAR AND COMPOSITION.—Pass.

REV. PROFESSOR JONES, EXAMINER.

1. Define Noun, Pronoun, Adjective, Adverb, Preposition, Inflection, Subject, Predicate.

2. What are abstract nouns? Explain, with examples, from what different parts of speech they are derived.