

angles to a plane, the other shall also be at right angles to the same plane.

5. Similar polygons inscribed in circles are as the squares of their diameters.
6. If a line be drawn from the vertex of an isosceles triangle to meet the base, or the base produced, the difference of the squares of that line, and of one of the equal sides of the triangle, is equal to the rectangle under the segments of the base. Apply this proposition to prove the 35th of the 3rd Book.
7. Divide harmonically a given finite straight line.
8. If the perpendicular B D in a right angled triangle divide the hypotenuse in medial section, the lesser side is equal to the alternate segment A D, and the three sides of such a right angled triangle are in continued proportion.

SECOND PAPER.

1. Define a *real* ; a *rational* ; an *irrational* quantity, and give examples of each.
2. Simplify the surds $4^3\sqrt[3]{81}$; $\sqrt[4]{432} + \sqrt[4]{256}$.
3. Prove the rule for finding the greatest common measure of a and b .
4. Prove that in the quadratic equation $x^2 + px - q = 0$ the sum of the roots is equal to the coefficient of the second term with the sign changed, and the third term is equal to the product of the roots.
5. Solve the Equations

$$\frac{48}{x^2} + \frac{32}{x} = 1$$

$$x - 2y = 2$$

$$3xy = 36$$

$$xy = 18 (x - y)$$

$$x^2 + y^2 = 117$$

$$(1 + x)^{\frac{1}{3}} + (1 - x)^{\frac{1}{3}} = 2^{\frac{1}{3}}$$

6. An alloy of copper and tin containing 100 cubic inches weighs 505 oz., how many oz., of each metal does it con-