

Worksheet

Students number

grade

Students name

Omar extended his method to solve any third-degree equations for positive roots. He discussed nineteen types of cubic equations (expressed with only positive coefficients). Each of the remaining fourteen he solved by means of conic sections. It is possible to classify these fourteen cubics, using modern notation (CARDAN 1501-1576).

To illustrate this reduction, take a cubic of the form

$$Z^3 + PZ^2 + qZ + r = 0$$

where the coefficients p, q and r can be positive, negative or zero.

Setting $Z = x - \frac{p}{3}$ in the above equation of the form $x^3 + bx = a$.

Calculate-----