

quantity sought furnishes the student with an easy and ready means of obtaining the solution, inasmuch as it indicates either the arithmetical operations, or the graphical construction to be performed.

When a problem is to be solved numerically, any expression, in which the quantity sought is put in terms of known quantities, will suit; should it be solved graphically, then the expression must be reduced to one of the five following formulas:—

(1) $x = a + b - c$ Sum and difference of lines.

(2) $x = \frac{bc}{a}$ Fourth proportional.

(3) $x = \sqrt{ab}$ Mean proportional.

(4) $x = \sqrt{a^2 + b^2}$ Hypotenuse.

(5) $x = \sqrt{a^2 - b^2}$ Side of a right angle.

III.

The first formula is evident by itself.

When $x = \frac{bc}{a}$, then it is a fourth proportional to a, b, c , because if both members of the equation are multiplied by a , we obtain

$$ax = bc$$

Hence, $a : b :: c : x$

Hence, in general, any fraction containing two factors of the first degree in the numerator, and one in the denominator, will express a *fourth proportional*.

When $x = \sqrt{ab}$, it is a mean proportional between a and b , because, if both members of the equation are raised to the second power, we obtain

$$x^2 = ab$$

Hence, $a : x :: x : b$

Hence, in general, any expression, being a radical of the second degree including two factors of the first degree, will represent a *mean proportional*.