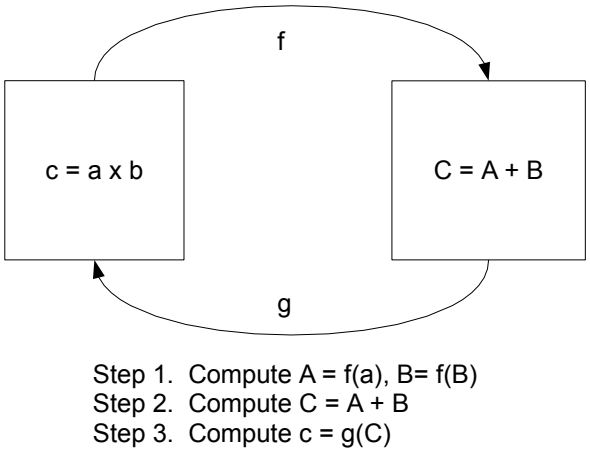


Figure 1.3: The first idea underlying the slide rule is that there are certain functions ($f$ and $g$ in the diagram) that transform multiplication and division into addition and subtraction. John Napier discovered such a pair of functions in the early 17th century.

number whose sine is $-0.34202$ is 200 degrees. Reading the table from right to left computes a function which undoes the sine (the function is called the arcsine). To compute the sine of 50 degrees, we know from the table that it is between 0.64279 and 0.86603 (the sines of 40 degrees and 60 degrees). If we take the midpoint of these two numbers we get 0.75441, which is close but not exactly the sine of 50 degrees which is 0.76604. Over the years, a number of formulas have been developed to interpolate between two values in a table to get more accurate answers.

There are two basic ideas underlying the slide rule:

The first idea is that certain functions can reduce multiplication and division to addition and subtraction. In 1614, John Napier (1550-1617) introduced a very nice function (a variant of today's logarithm function) with the property of reducing multiplications to additions. See Figure 1.3.

The second idea is due to Edmund Gunter (1581-1626).