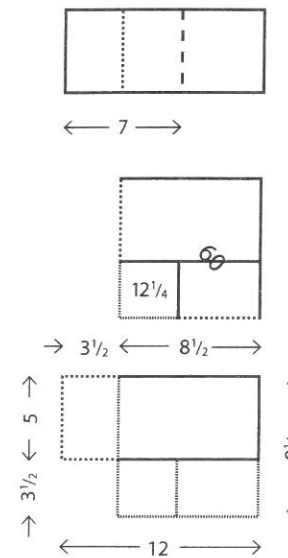


Geometrical algebra

In recent years Jens Høyrup has written extensively and authoritatively on Old Babylonian geometrical algebra, which comprises about half of the Old Babylonian corpus of mathematical problems [Høyrup 2002]. He has shown that underlying the apparently arithmetized texts are fundamentally concrete formulations that describe how to manipulate areas and lines in order to find unknowns. YBC 6967 is one of the simplest examples [MCT, text Ua; Høyrup 2002, 55–58]. The problem is to find a pair of mutual reciprocals knowing only the difference between them (and, by definition, that their product is 60: see BM 106444, on page 79). By visualizing the unknowns as the sides of rectangle of area 60 the rectangle can be manipulated into a gnomon and the original lengths found by completing the square:



No such diagrams survive on the tablets themselves, but their use is inferred through a literal interpretation of the operations described. They explain, for instance, how two halves of a quantity can be manipulated independently of each other—whereas in symbolic algebra, a halved quantity is simply shrunk, rather than cut in two—and why each of four different verbs of multiplication is used in any particular context, as each has a specific geometrical or arithmetical function.