

Sample problem like 6(b) on the final exam

This elaborates on a point at the end of the June 4 lecture.

Suppose that we asked a similar question about al – Khwarizmi; namely, what did he overlook and what did he do particularly well? We shall only list one issue of each type.

One thing he overlooked was the usefulness of negative numbers and zero, both of which were known to Indian mathematicians from earlier generations. Use of these numbers ultimately reduced his various cases of linear and quadratic equations to a single case each (in the 16th century setting of Vieta).

One thing he did particularly well was to give an organized account of methods for solving equations and to view the latter as objects worthy of attention in their own right.

The problem does not ask about items where the record is mixed, but one could say this about the extent to which he isolated the formal manipulations of equations from the classical Greek setting in terms of geometrical figures. He took some steps in this direction, but stopped short of doing this completely. This was done by other Arabic mathematicians beginning with Abu Kamil.