What is the difference between al-Khwarizmi's work on algebra and Thabit ibn Qurra's (836-901)?

We consider the cases $x^2 + q = px$ and $x^2 + px = q$ as illustrations of Ibn Qurra's approach to solving quadratic equations. He used two theorems from Euclid's *Elements,* and creatively applied them to solving these equations.

Proposition 5 (Book II): If a line segment AE is bisected at W and divided at B then the area of the rectangle AB x BE plus the square on BW is equal to the square on AW.
Note that there are two cases to consider here. Draw a figure to illustrate each case.

Here is how Ibn Qurra used the above theorem to solve $x^2 + q = px$.

Algebraically,

Purely algebraic way of completing the square:

Proposition 6 (Book II): If a line segment BH is bisected at W and extended in a straight line to BA then the area of the rectangle AH x AB plus the square on BW is equal to the square on AW.
Draw a figure to illustrate this theorem.

Here is how Ibn Qurra used the above theorem to solve $x^2 + px = q$ (there is a typo in the book: in Fig 4.5, roots = px, not p).

Algebraically,

Purely algebraic way of completing the square: