A Significant New Look at Quadratic Functions

Introducing ***The Migration Method*** ...

Introduction

Two years ago, a contract was signed with Harcourt College Publishers for the development of a new series of textbooks in developmental mathematics (PreAlgebra through Intermediate Algebra). Writing these textbooks has been a daunting task, yet one that has provided many surprising turns and diverse rewards. wish to share one of the more substantial "surprises" in this dialogue. Long before pen was put to paper, I made a conscious decision to present and develop the graph of a function *prior* to solving any of the related inequalities. Having always been bothered by the "blind" interval tests seen in many texts, set about laying groundwork that might enable students to "see" solutions mentally, understand them more completely and solve inequalities with far fewer tests. Linear functions presented no challenge, as a student need only find the x intercept and consider the slope of the line. Likewise, a "visual" solution to absolute value inequalities can easily be developed from characteristics of the graph. However, this presented the challenge of discussing absolute value inequalities *before the topic of translations had been addressed.* While immersed in the consideration of this function and the characteristics of its' graph, was struck once again by its similarity to the graph of a quadratic function. Noting particularly that the rate of change between a vertical shift of $f(x) = |x|$ and the zeroes of this function was constant, reasoned that perhaps a similar relationship existed between a vertical shift of $f(x) = x^2$ and its zeroes. The resulting analysis has opened doors and yielded ideas that have apparently not been opened or explored previously. This paper describes a new technique for graphing a quadratic function and finding its zeroes, which I have dubbed ***The Migration Method*** for reasons that will soon be apparent.