

Situation 15: Graphs of Quadratics

Prepared at UGA Center for Proficiency in Teaching Mathematics
6/28/05-Ginger Rhodes

Prompt

Matt and I worked together to plan a lesson on graphing quadratic functions. I asked Matt what he remembered about quadratic functions, and he said he remembered very little: he said it was a parabola and that was about all he knew. I asked him what he wanted students to be to do and he said he wanted them to be able to identify the domain/range, max/min point, and vertex, as well as graph the function. The book had

$$x = -\frac{2a}{b}$$

as the equation of the line of symmetry, which was also used to find the x-coordinate of the vertex. The book did not show how to derive this equation, so I asked Matt if he knew how - he said no. So then we talked about how to derive this equation using the quadratic formula, and whether this was something that his students should understand. He thought this was too difficult for his concepts of algebra students.

So then we talked about what the students had been doing recently, which was domain/range of functions and linear functions. We discussed how this connected to the lesson he was planning for, and Matt really struggled. I was thinking about the connection between linear functions and quadratic functions: such as what students can find from the graphs of functions, or from the equations. We looked at the linear function

$$f(x) = 2x + 7$$

and the quadratic function

$$f(x) = x^2 + 10x + 25$$

I asked him what he thought his students could do with the linear function, and he said they could find the slope, the y-intercept, and probably graph the line. I asked him if he thought his students knew what the domain and range was for a linear function, and he did not think so. By the end of our planning session we had decided to begin with a warm-up reviewing linear functions (how to graph, domain/range, slope, and y-intercept), and then introduce a quadratic function by asking how it looks different, what they know about it, and connecting to the linear function. Matt was not confident with the mathematical connections, and therefore this conversation did not go the way I envisioned it. The conversation was very procedural and the connections were not made.

Matt is a student teacher. What else should I do to help him?

Commentary

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