

Situation 17: Equivalent Equations
Prepared at UGA
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Prompt

Students in a second year algebra class have been working on using graphs as one tool in solving quadratic equations. When the students were solving linear equations, the teacher placed a lot of emphasis on generating and recognizing equivalent equations (e.g., $2x + 6 = 18$ is equivalent to $x = 6$), but the students did not graph these equations to solve them. In their current work, one group of students contend that $2x^2 - 6x = 20$ cannot be equivalent to $x^2 - 3x - 10 = 0$ because the graphs don't look the same—in fact in graphing the first equation, you have to graph $y = 2x^2 - 6x$ and the line $y = 20$, while in the second you graph $y = x^2 - 3x - 10$ and the line $y = 0$ (which you don't really have to graph since it's just the x -axis).

What kind of mathematical knowledge does the teacher need to consider in responding to these students?

Commentary

Mathematical Foci

Mathematical Focus 1

Mathematical Focus 2

Mathematical Focus 3

Mathematical Focus 4