

# Math Diversion 1065

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A lot of the time you do math, you're stuck, but  
at the same time there are all these moments  
where you feel privileged that  
you get to work with it.

— Akshay Venkatesh  
(Fields Medal Winner)

Source: Intermediate Algebra for College Students,  
3rd Ed. Prentice-Hall (2002), p. 181 #21.

Title: Mixed Rate

Presenter: R. Blitzer

## 1 Problem

At the north campus of a small liberal arts college, 10% of the students are women. At the south campus, 50% of the students are women. The campuses are merged into one east campus, of which 40% of the 1200 students are women. How many students were in the north and south campuses before the merger?

## 2 Solution

Our figure needs to represent all three campuses in the boxes.

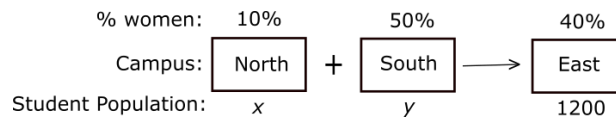


Figure 1. A standard setup.

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Balancing on students before and after the merger, we get

$$x + y = 1200. \tag{1}$$

Balancing on the number of women before and after the merger, we get

$$.1x + .5y = .4(1200). \quad (2)$$

The solutions to these last two equations are  $x = 300$ , and  $y = 900$ .