Math Diversion 1032

P. Reany

February 2, 2026

> You cannot read mathematics the way you read a novel. If you zip through a page in less than an hour, you are probably going too fast.
>
> — Sheldon Axler
> (from *Linear Algebra Done Right*)

```
Source: https://gmatclub.com/forum/at-a-certain-company-40
-of-the-women-are-over-50-years-old-and-50-o-205994.html
Title: A mixed-Rate Problem
Presenter: Patrick
```

1 Problem

At a certain company, 40% of the women employees and 50% of the men employees are 50 or older. If that amounts to 42% of all the company's employees are 50 or older, what percentage of the company's employees are men?

2 Solution

My experience with percentage problems has led me to start with the precise definition of the percentage I'm tasked with finding and then, if useful, search for totals and parts. But often the information needed is provided in constitutive relations, instead.

Let's begin with the initial percentages. Let M be the number of men in the company. Let W be the number of women in the company.

$$.40W = W_{\geq 50} \quad \text{and} \quad .50M = M_{\geq 50}\,. \tag{1}$$

The percentage we're looking for is given by

$$P = \frac{M}{M+W} \times 100\%\,. \tag{2}$$

Let's begin with a figure.

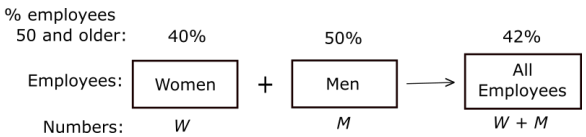

Figure 5. I was raised on the commercial: Things go better with Coke (the soft drink), but as a algebraist, I believe that things go better with diagrams.

Now, balancing on the number of employees 50 and older on both sides, we get:

$$.40W + .50M = .42(W + M)\,. \tag{3}$$

My favorite way to proceed in this situation is to divide through by M and let $\lambda = W/M$. Then (2) and (3) become

$$P = \frac{1}{1+\lambda} \times 100\%\,, \tag{4a}$$

and

$$.40\lambda + .50 = .42(\lambda + 1)\,. \tag{4b}$$

Solving this last equation for λ, we get $\lambda = 4$. Substituting this into (4a), we get

$$P = \frac{1}{1+4} \times 100\%\,. \tag{5}$$

From this we get that 20% of the company's employees are men.