Math Diversion Problem 880

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> Space can kill you quickly or it can kill you
> slowly. But it's always trying to kill you.
> — Dr. James Logan
> [Former Nasa Medical Officer]

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Source: Finite Mathematics, 5th Ed. Brooks/Cole  (2002), p. 57.
Title: A Mixed-Rate problem.
 Presenter:  H. Rolf
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1 Problem

A woman must control her diet. She selects milk and bagel for breakfast. How much of each should she serve in order to consume 700 calories and 28 grams of protein? Each cup of milk contains 170 calories and 8 grams of protein. Each bagel contains 138 calories and 4 grams of protein.

2 Solution

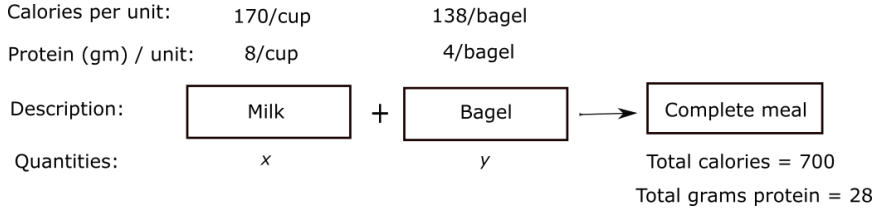

Figure 1. As usual, rates are placed above and quantities and totals are placed below. The unit for x is cups and for y is bagels.

We simply have two totals to deal with as constraints on the amounts of each. Referencing Figure 1, we have that

$$\begin{aligned} 170x + 138y &= 700\,, \\ 8x + 4y &= 28\,, \end{aligned} \tag{1}$$

which has solution

$$x = \frac{133}{53} \approx 2.5 \quad \text{and} \quad y = \frac{105}{53} \approx 2\,. \tag{2}$$

That is, the meal is to consist of 2.5 cups of milk and 2 bagels.