# Math Diversion Problem 799

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September 15, 2025

> It is customary, in developing the method of Green's functions,
> to require that the boundary conditions be homogeneous,
> with all the inhomogeneity contained in
> the differential equation.
> — Michael D. Greenberg
> *Applications of Green's Functions*
> *in Science and Engineering*, p. 5.

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Source: The Ether of Great Mathematical Ideas
Title:  Word Problem
 Presenter: Patrick
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## 1 Problem

Three different varieties of wheat are to be mixed in proportions 1 : 1 : 2 to produce a wheat mixture of specified requirements. If the cost per kilogram of the first two varieties are, respectively, \$126/Kg and \$135/Kg, and the final mix is \$153/Kg, what is the cost per kilogram of the third variety?

## 2 Solution 13.3.1: Conceptualizing the Problem

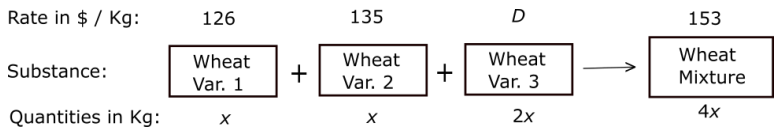


Figure 3. We've already indicated on the figure that the chosen quantities in the diagram satisfy the ratio constraints.

We can satisfy the ratio requirements right off by setting the kilograms of the first variety to be $x$. Then the next is also $x$ and the third is $2x$. Now, let $D$ be the cost of the third variety in dollars per kilograms.

The cost conservation equation becomes

$$126(x) + 135(x) + D(2x) = 153(4x)\,. \tag{1}$$

Since the value of $x$ is not zero, we can divide it out of the above equation, to get

$$126 + 135 + D(2) = 153(4)\,, \tag{2}$$

with solution D = \$175.50 per kilogram.