

Math Diversion 950

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The most dangerous phrase in the language is,
‘We’ve always done it this way.’
— Grace Hopper, computer pioneer

Source: <https://www.basic-mathematics.com/hard-word-problems-in-algebra.html>
Title: An hourly-wage comparison problem
Presenter: Patrick

1 The Problem

Problem 99. Jacob’s hourly wage is 4 times as much as Noah. When Jacob got a raise of 2 dollars Noah accepted a new position that pays him 2 dollars less per hour. Jacob now earns 5 times as much money as Noah. How much money do they make per hour after Jacob got the raise?

Solution

Let’s begin with a tabular diagram:

	Jacob	Noah	Constitutive Relations
Beginning Wages	J	N	$J = 4N$
Ending Wages	$J + 2$	$N - 2$	$J + 2 = 5(N - 2)$

Figure C3. As a general rule, I avoid placing algebraic information into tables, but in this kind of problem (a ‘temporal’ problem), a table works very well.

As in the previous problem, we find the solution by simultaneously solving the constitutive relations presented in the diagram, obtaining (in units of dollars per hour) $J = 48$ and $N = 12$. Therefore, after the wages change:

$$J + 2 = 50, \quad N - 2 = 10. \tag{1}$$