Math Diversion 723

P. Reany

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> The truth is only effective against an
> honest and sound mind.
> —The Author

The problem is found at:

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Source: https://www.algebra.com/algebra
Title: Question 22466
 Presenter: Patrick
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1 Problem

Working together, A and B can do a job in 4 days. Working alone, A takes twice as long as B to do the job. Find their individual rates.

2 Solution

The rates at which A and B work the job are, respectively, R_A and R_B. Again, these have units of job/hour, but, again, some of the information given to us forces us to compare their hours/job, requiring the multiplicative inverses of R_M and R_A. So, let the time it takes B to do the job be T hours. Then, $R_B^{-1} = T$ hours/job and $R_A^{-1} = 2T$ hours/job. Therefore, $R_A = 1$ job/(2T hours) and $R_A = 1$ job/(T hours).

For our second equation, we take the total of one job being done by A and B, working for same quantity of time, namely, 4 days:

$$1 = \frac{1}{2T}\,4 + \frac{1}{T}\,4\,, \tag{1}$$

with units suppressed, as usual. Solving this for T we get 6 days. Then, $2T = 12$ days. We're almost done. $R_A = 1$ job/(12 days) and $R_B = 1$ job/(6 days).