Math Diversion Problem 902

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November 14, 2025

> When I give this talk to a physics audience, I
> remove the quotes from my 'Theorem'.
> — Brian Greene

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Source: https://www.mgccc.edu/learning\_lab/
      math/alg/howtomix.pdf
Title: Alcohol Dilution Problem
 Presenter: Patrick
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1 The Problem

How much water must be added to 14 oz of a 20% alcohol solution to obtain a 7% alcohol solution?

2 Solution

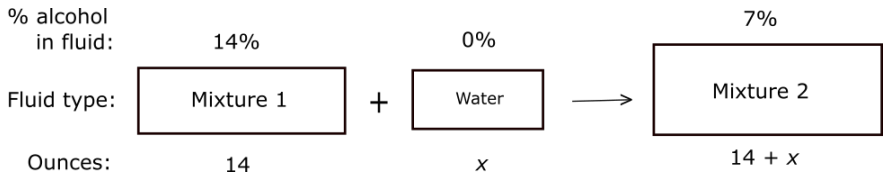

Figure 1. Standard setup for calculation: We've already shown the conservation of overall volumes in ounces.

We need just one equation, which we'll get from balancing on alcohol (the ounces, that is) on both sides:

$$(.14)x + (0)x = (.07)(14 + x)\,. \tag{1}$$

which has solution $x = 14$.