Math Diversion Problem 560

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The YouTube video is found at:

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Source: https://www.youtube.com/watch?v=wQrM5usqXAQ
Title: Tea Price Doubled
 Presenter: TableClass Math
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1 The Problem

The cost of your favorite tea doubled, with 7% tax you now pay $12.50. What was the original price?

2 The Preparation

We need some terms defined. The **retail price** is the pretaxed price. The **cost** (to the customer) is the retail price plus whatever tax is to be applied.

3 The Solution

When we are given a word problem, we look for totals. If we can find one, it is algebraically equal to the sum of its parts. So, the new total cost of tea (which includes tax) is $12.50, which is equal to the sum of its parts.

$$\$12.50 = (\text{new retail price}) + (\text{tax})\,. \tag{1}$$

We'll call the old retail price of the tea P. Thus, this last equation becomes

$$\$12.50 = 2P + (0.07)(2P) = 1.07(2P) = 2.14P\,. \tag{2}$$

On solving for P, we get (rounded to the nearest penny)

$$P = \frac{\$12.50}{2.14} = \$5.84\,. \tag{3}$$