7.RP Buying Protein Bars and Magazines

Alignments to Content Standards: 7.RP.A.3

Task

Tom wants to buy some protein bars and magazines for a trip. He has decided to buy three times as many protein bars as magazines. Each protein bar costs $0.70 and each magazine costs $2.50. The sales tax rate on both types of items is 6½%. How many of each item can he buy if he has $20.00 to spend?

Solutions

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Solution: Using a ratio table

The table below shows the cost for the protein bars and magazines in a 3 : 1 ratio.

Number of protein bars	3	6	9	12
Value of the magazines	$2.50	$5.00	$7.50	$10.00
Value of the protein bars	$2.10	$4.20	$6.30	$8.40

Value of both magazines and candy bars	$4.60	$9.20	$13.80	$17.40
Cost with tax	$4.90	$9.80	$14.70	$19.60

Looking at the last column of the table, we can see that Tom can buy 4 magazines and 12 protein bars for $20 and that he cannot afford 5 magazines and 15 protein bars.

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Solution: 1 magazine and 3 protein bars as a single unit

Tom's decision to buy three times as many protein bars as magazines can be thought of as deciding to buy in a unit consisting of 1 magazine AND 3 protein bars.

The cost of a unit then is $\$2.50 + 3 \times (\$0.70)$, which is $4.60.

With sales tax, this would be $\$4.60 \times 1.065$, which when rounded to the nearest cent would be $4.90, or just under $5.00.

There are four groups of five in 20 and $4 \times 4.899 = 19.596$. This leaves $0.40 in change. So, with $20, he can buy 4 magazines and 12 protein bars, with $0.40 in change.