

Math League Contest Problem Set 12213

Target Round Problem 7

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Identify our objective.

At a certain restaurant, if a customer tips x percent, the bill is supposed to be increased by $(x + 8)\%$ to account for tip and sales tax. However, it was found that the automatic tipping system used by the restaurant was using a faulty method: it first increased the bill by x percent, and then increased the resulting amount by 8 percent. For a bill of \$60 before the tip and the tax, the final cost was 72 cents more than it should have been. How much did the customer tip, in percent?

Find x .

The incorrect total cost was

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The difference between these costs was 0.72 dollars, so

$$1.08 \cdot \frac{3}{5} \cdot x - \frac{3}{5} \cdot x = 0.72.$$

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Now we can solve for x .

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$$x = 0.72 \cdot \frac{1}{0.08} \cdot \frac{5}{3} = \frac{0.72}{0.24} \cdot 5 = 3 \cdot 5 = \boxed{15}$$

Review the key concepts we used.

Key Concepts

- Percents
- Single Variable Equation