Answer on question #78494 / Math/ Algebra

The annual bonus given to the employees of a company is 5% of their taxable incomes, after the state and central taxes are deducted. The state tax is 10% of taxable income. The central tax is 20% of taxable income after deducting the state tax. Formulate this situation for determining the bonus, as a linear system.

Solution:

Denote:

Bonus – z

Taxable Incom - x

Taxes - y

Then the state tax is $0.1x$, the central tax is $0.2(x-0.1x)$.

We formulate a system of linear equations

$$\begin{cases} z = 0.05(x-y) \\ y = 0.1x + 0.2(x-0.1x) \end{cases}$$

solution of the system. We express z in terms of x

$$\begin{cases} z = 0.05(x-y) \\ y = 0.1x + 0.2 \times 0.9x \end{cases}$$

$$\begin{cases} z = 0.05(x-y) \\ y = 0.1x + 0.18x \end{cases}$$

$$\begin{cases} z = 0.05(x-y) \\ y = 0.28x \end{cases}$$

$z = 0.05(x-0.28x) = 0.05 * 0.72x = 0.036x.$

Answer:

Bonus given 3.6% of taxable income before the state and central taxes are deducted.