# Answer on Question #54051 – Math – Algebra

1) A motorist buys 24 litres of petrol and 5 litres of oil for 310.70. While another motorist buys 18 litres of petrol and 10 litres of oil for 295.40 at the same garage. Find the cost of one liter of petrol at this garage.

**Solution**

Let's denote:

$x$ = cost of one liter of petrol

$y$ = cost of one liter of oil

Thus, we obtain the system of linear equations:

$$\begin{cases} 24x+5y=310.7 \\ 18x+10y=295.4 \end{cases}$$

We multiply the first equation by 3, and the second equation by 4:

$$\begin{cases} 72x+15y=932.1 \\ 72x+40y=1181.6 \end{cases}$$

Interchange equations of the system:

$$\begin{cases} 72x+40y=1181.6 \\ 72x+15y=932.1 \end{cases}$$

Divide the first equation by 4, subtract the second equation from the first one:

$$\begin{cases} 18x+10y=295.4 \\ 25y=249.5 \end{cases}$$

Now let's divide the second equation by 25:

$$\begin{cases} 18x+10y=295.4 \\ y=9.98 \end{cases}$$

and then substitute for $y$ in the first equation:

$$\begin{cases} 18x+99.8=295.4 \\ y=9.98 \end{cases}$$

Subtract 99.8 from both sides of the first equation:

$$\begin{cases} 18x=195.6 \\ y=9.98 \end{cases}$$

Divide the first equation by 18:

$$\begin{cases} x=10.8(6) \\ y=9.98 \end{cases}$$

Thus, one liter of oil costs 9.98 and one liter of petrol costs 10.8(6) (approximately 10.87).

**Answer:** one liter of oil costs 9.98 and one liter of petrol costs 10.8(6) (approximately 10.87).