ANSWER on Question #72591 Math. Linear Algebra

$$h(3x + 9) = 6x + 18$$

SOLUTION

In the proposed assignment there were no additional explanations, but there was only this formula, so the task can be understood in different ways. I will indicate the question and how to answer it.

1) From the proposed formula, express x in terms of h.

$h \in \mathbb{R}$ is a given, unknown number.

$$h(3x + 9) = 6x + 18 \rightarrow 3hx + 9h = 6x + 18 \rightarrow 3hx - 6x = 18 - 9h$$

$$3hx - 6x = 18 - 9h \rightarrow 3x(h - 2) = 9(2 - h)| \div \big(3(h - 2)\big), h \neq 2$$

$$x = \frac{9(2 - h)}{3(h - 2)} = \frac{-9(h - 2)}{3(h - 2)} = -3 \rightarrow \boxed{x = -3}$$

ANSWER

$$x = -3$$

2) From the proposed formula, express h in terms of x.

$x \in \mathbb{R}$ is a given, unknown number.

$$h(3x + 9) = 6x + 18 \rightarrow h = \frac{6x + 18}{3x + 9}, x \neq -3$$

$$h = \frac{6x + 18}{3x + 9} = \frac{6(x + 3)}{3(x + 3)} = \frac{6}{3} = 2 \rightarrow \boxed{h = 2}$$

ANSWER

$$h = 2$$

3) $h(x) = mx + b$ - is a linear function. It is necessary to determine the coefficients m and b.

$$h(3x + 9) = m(3x + 9) + b = 3mx + 9m + b$$

$$h(3x + 9) = 6x + 18 - \text{ by condition}$$

Then,

$$3mx + 9m + b = 6x + 18 \rightarrow \begin{cases} 3m = 6| \div (3) \\ 9m + b = 18 \end{cases} \rightarrow \begin{cases} m = \dfrac{6}{3} = 2 \\ 9 \cdot 2 + b = 18 \end{cases} \rightarrow$$

$$\begin{cases} m = 2 \\ 18 + b = 18 \end{cases} \rightarrow \begin{cases} m = 2 \\ b = 18 - 18 \end{cases} \rightarrow \boxed{\begin{cases} m = 2 \\ b = 0 \end{cases}}$$

Conclusion,

$$\boxed{h(x) = 2x}$$

ANSWER

$$h(x) = 2x$$