Answer on Question #46832 – Math - Algebra

Problem

$$x(x-3)+x(x-4)=12-x$$

Solution

Rewrite the equation as a quadratic one:

$$\begin{aligned}
&x(x-3)+x(x-4)=12-x\\
&x^2-3x+x^2-4x=12-x\\
&2x^2-7x=12-x\\
&2x^2-7x-12+x=0\\
&2x^2-6x-12=0\\
&x^2-3x-6=0
\end{aligned}$$

Then solve it:

$$D=b^2-4ac=(-3)^2-4\cdot 1\cdot(-6)=9+24=33$$
$$x_{1,2}=\frac{-b\pm\sqrt{D}}{2a}=\frac{-(-3)\pm\sqrt{33}}{2\cdot 1}=\frac{3\pm\sqrt{33}}{2}$$

Thus, there are two solutions:

$x_1=\frac{3-\sqrt{33}}{2}$ and $x_2=\frac{3+\sqrt{33}}{2}$.