System of Equations (Elimination)

Each of the following systems has a solution. Determine the solution to the system by eliminating one of the variables.

1. $\begin{cases} y = -4x + 6 \\ 2x - y = 11 \end{cases}$

2. $\begin{cases} \frac{1}{2}x + 5 = y \\ 2x + y = 1 \end{cases}$

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1. $\begin{cases} y = -4x + 6 \\ 2x - y = 11 \end{cases}$

$2x - (-4x + 6) = 11$

$2x + 4x - 6 = 11$

$6x = 17$

$x = \dfrac{17}{6}$

$y = -4\left(\dfrac{17}{6}\right) + 6$

$y = -\dfrac{34}{3} + 6$

$y = -\dfrac{16}{3}$

The solution is $\left(\dfrac{17}{6}, -\dfrac{16}{3}\right).$

2. $\begin{cases} \dfrac{1}{2}x + 5 = y \\ 2x + y = 1 \end{cases}$

$2x + \dfrac{1}{2}x + 5 = 1$

$\dfrac{5}{2}x + 5 = 1$

$\dfrac{5}{2}x = -4$

$x = -\dfrac{8}{5}$

$2\left(-\dfrac{8}{5}\right) + y = 1$

$-\dfrac{16}{5} + y = 1$

$y = \dfrac{21}{5}$

The solution is $\left(-\dfrac{8}{5}, \dfrac{21}{5}\right).$

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