

Answer on Question #58788– Math– Algebra

Question

Solve for x and y :

$$3x+4y=9, 2x+3y=8.$$

Solution

We have the system of linear equations

$$\begin{cases} 3x + 4y = 9 \\ 2x + 3y = 8 \end{cases} \quad (1)$$

Expressing x from the first equation of (1) and substituting for x into the second equation of (1) we obtain

$$\begin{aligned} \begin{cases} 3x = 9 - 4y \\ 2x + 3y = 8 \end{cases} &\Rightarrow \begin{cases} x = \frac{9 - 4y}{3} \\ 2x + 3y = 8 \end{cases} \Rightarrow \begin{cases} x = \frac{9 - 4y}{3} \\ 2 \cdot \frac{9 - 4y}{3} + 3y = 8 \end{cases} \Rightarrow \begin{cases} x = \frac{9 - 4y}{3} \\ 2(9 - 4y) + 9y = 24 \end{cases} \Rightarrow \\ &\Rightarrow \begin{cases} x = \frac{9 - 4y}{3} \\ 18 - 8y + 9y = 24 \end{cases} \Rightarrow \begin{cases} x = \frac{9 - 4y}{3} \\ y = 6 \end{cases} \Rightarrow \begin{cases} x = \frac{9 - 4 \cdot 6}{3} \\ y = 6 \end{cases} \Rightarrow \begin{cases} x = \frac{-15}{3} \\ y = 6 \end{cases} \Rightarrow \begin{cases} x = -5 \\ y = 6. \end{cases} \end{aligned}$$

Answer: $x=-5, y=6$.