Answer on Question #64308 – Math – Algebra

Question

x-y=w

x+4y=3v

x-v2=w2

5v+x=w

x2=6y

x2+v=w2

x2+v=w2

x2 divide by 2=w-y

x2+7 divide by w =y

x divide by y-7 =v

Solution

It follows from the fifth equation $x^2 = 6y$ of the system that

$$y = \frac{x^2}{6} \quad (1)$$

Substituting (1) into the first equation $x - y = w$ of the system obtain

$$x - \frac{x^2}{6} = w \quad (2)$$

Using (1) and (2) it follows from the eighth equation $\frac{x^2}{2} = w - y$ of the system that

$$\frac{x^2}{2} = \left(x - \frac{x^2}{6}\right) - \frac{x^2}{6},$$

$$\frac{x^2}{2} = x - \frac{x^2}{6} - \frac{x^2}{6},$$

$$\frac{x^2}{2} = x - \frac{x^2}{3},$$

$$\frac{5x^2}{6} - x = 0,$$

$$x\left(\frac{5x}{6} - 1\right) = 0,$$

$$x = 0 \text{ or } \frac{5x}{6} - 1 = 0,$$

$$x = 0 \text{ or } x = \frac{6}{5}.$$

If $x = 0$, then one gets $y = \frac{0^2}{6} = 0$ using (1) and $w = 0 - \frac{0^2}{6} = 0$ using (2), but it affects the ninth equation $x^2 + \frac{7}{w} = y$. Because it is not possible to divide by zero, then $x = 0, y = 0, w = 0$ is not a solution of the system.

If $x = \frac{6}{5}$, one gets $y = \frac{\left(\frac{6}{5}\right)^2}{6} = \frac{6}{25}$ using (1) and $w = \frac{6}{5} - \frac{\left(\frac{6}{5}\right)^2}{6} = \frac{6}{5} - \frac{6}{25} = \frac{24}{25}$ using (2). Substituting $x = \frac{6}{5}$, $y = \frac{6}{25}$, $w = \frac{24}{25}$ into the ninth equation $x^2 + \frac{7}{w} = y$:

$$\left(\frac{6}{5}\right)^2 + \frac{7}{\frac{24}{25}} = \frac{6}{25},$$

$$\frac{36}{25} + \frac{175}{24} = \frac{6}{25},$$

$$\frac{36 \cdot 24 + 175 \cdot 25}{25 \cdot 24} = \frac{6}{25},$$

$$\frac{5239}{600} = \frac{6}{25},$$

which is false.

Then $x = \frac{6}{5}, y = \frac{6}{25}, w = \frac{24}{25}$ is not a solution of the system.

Answer: no solution.