

QUESTION Find non-zero λ, μ, ν such that

$$\lambda(1, 2, 3) + \mu(4, 5, 6) + \nu(7, 8, 9) = (0, 0, 0)$$

ANSWER This is equivalent to solving

$$\begin{aligned}\lambda + 4\mu + 7\nu &= 0 \\ 2\lambda + 5\mu + 8\nu &= 0 \\ 3\lambda + 6\mu + 9\nu &= 0\end{aligned}$$

which has $(\lambda, \mu, \nu) = (1, -2, 1)$ as a solution (or any multiple).