Step-1

We have to construct a 3 by 3 system that has 9 different coefficients on the left-hand side, but rows 2 and 3 become zero in elimination. And we have to find that how many solutions to our system with $b=(1,10,100)$ and how many with $b=(0,0,0)$

Step-2

Let the required 3 by 3 system be

$$\begin{aligned} x+2y+3z &= 1 \\ 4x+8y+12z &= 4 \\ 5x+10y+15z &= 5 \end{aligned}$$

The above system has 9 different coefficients in the left hand side. By performing row 2 $-$ 4 times row 1 and row 3 $-$ 5 times row 1, row 2 and row 3 will be eliminated.

Step-3

When $b=(1,10,100)$, then the system has no solution because after elimination it leads to $0=6$, this is absurd, so there is no solution.

Step-4

When $b=(0,0,0)$, then the system has infinite solutions since after elimination of row2 and row 3, we get a single row as $x+2y+3z=0$.