

**Problem 1:** Solve the following system of linear equations, by elimination:

$$\begin{aligned}x + y &= 2 \\ 4x + y &= 5\end{aligned}$$

Answer:  $x = 1, y = 1$ .

**Problem 2:** The following system of linear equations cannot be uniquely solved using elimination. Why not?

$$\begin{aligned}x + y &= 2 \\ 2x + 2y &= 4\end{aligned}$$

Answer: Anything like “There’s more than one solution”, “They’re the same equation, fundamentally”, or “They’re the same line/parallel” was taken as a valid answer. The key thing to notice is that when we try to eliminate, we get  $0 = 0$ ;

$$\begin{aligned}x + y &= 2 \\ 2x + 2y &= 4 \\ -2x - 2y &= -4 \text{ (Multiply first equation by -2)} \\ 0 &= 0 \text{ (Add the above two equations.)}\end{aligned}$$

Coming up with two different solutions would also have worked.