

Step-1

Given that the three planes can fail to have an intersection point, when two planes are parallel. And the system is singular if row 3 of A is a _____ of the first two rows.

We have to fill this blank and we have to find a third equation that can't be solved if $x + y + z = 0, x - 2y - z = 1$

Step-2

The system is singular if row 3 is a combination of row 1 and row 2.

From the end view the three planes form a triangle.

This happens if rows 1 + rows 2 = rows 3 on the left hand side but not right hand side.

For example:

$$x + y + z = 0$$

$$x - 2y - z = 1$$

$$2x - y = 9$$

Here no two planes are parallel but still no solution.