Chapter 9 / **Example 41**

Intersecting planes

Given the three planes $\pi_1 : 2x - 3y + 5z = 1$, $\pi_2 : x + 2y - z = 0$ and $\pi_3 : 2x + 4y - 2z = 1$, show that:

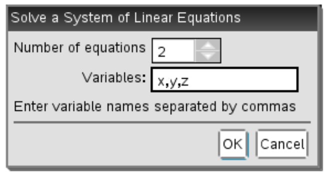
a $\pi_2 \parallel \pi_3$ **b** π_1 and π_2 intersect and find the equation of the line.

Open a new document and add a Calculator page.

Press menu 3:Algebra | 2:Solve System of Linear Equations…

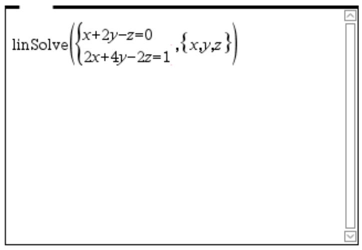
Select 2 equations and edit Variables by changing x,y to x,y,z.

Press enter.



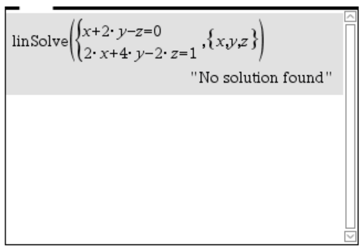
Solve the equations $\begin{cases} x + 2y - z = 0 \\ 2x + 4y - 2z = 1 \end{cases}$

Type the equations and press enter.



The calculator displays no solution found.

If two planes do not intersect, then they must be parallel.



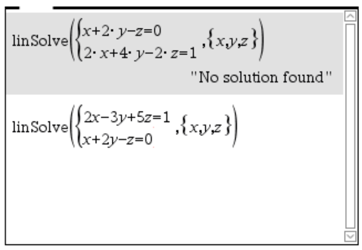
Press menu 3:Algebra | 2:Solve System of Linear Equations…

Select 2 equations and edit Variables by changing x,y to x,y,z.

Press enter.

Solve the equations $\begin{cases} 2x - 3y + 5z = 1 \\ x + 2y - z = 0 \end{cases}$

Type the equations and press enter.



Chapter 9 / **Example 41**

Intersecting planes

The calculator displays the solution:

$$\begin{cases} x = \frac{2}{7} - \mathbf{c2} \\ y = \mathbf{c2} - \frac{1}{7} \\ z = \mathbf{c2} \end{cases} \quad \text{or} \quad \begin{cases} x = \frac{2}{7} - \mu \\ y = -\frac{1}{7} + \mu \\ z = \mu \end{cases} \quad \text{or} \quad \frac{x - \frac{2}{7}}{-1} = \frac{y + \frac{1}{7}}{1} = \frac{z}{1}$$