

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:

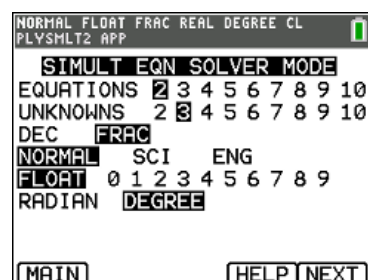
- a** $\pi_2 \parallel \pi_3$ **b** π_1 and π_2 intersect and find the equation of the line.

Press **[APPS]** :PlySmlt2.

Press **[enter]** and select 2:SIMULTANEOUS EQN SOLVER.

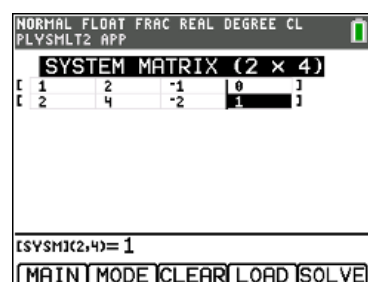
You are solving 2 equations with 3 unknowns.

Press **[f5]** NEXT.



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

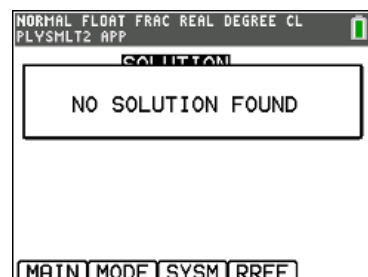
Enter to coefficients into the matrix.



Press **[f5]** SOLVE.

The calculator displays no solution found.

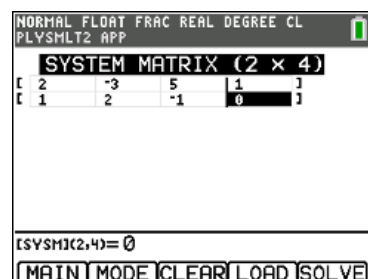
If two planes do not intersect, then they must be parallel.



Press **[f3]** SYSM and **[f3]** CLEAR.

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

Enter to coefficients into the matrix.



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Press $\boxed{\text{f5}}$ SOLVE.

The calculator displays the solutions

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

NORMAL FLOAT FRAC REAL DEGREE CL
PLVSM12 APP

SOLUTION SET

X1 $\frac{2}{7} - X3$
X2 $-\frac{1}{7} + X3$
X3 $X3$

MAIN MODE SYSM STORE RREF