

Sort It Out

Systems of Three Linear Equations

Sort each system of linear equations into the correct group depending on whether the solutions are consistent or inconsistent and how the system is represented geometrically. Where the planes meet at a single point, find the coordinates of the point of intersection.

1	$\begin{aligned} 2x + 5y + 3z &= 18 \\ -2x + 4z &= 5 \\ 3x + 10y + 8z &= 10 \end{aligned}$	2	$\begin{aligned} 4x + 6y - 2z &= 11 \\ -x + 4y + z &= -1 \\ 2x + 3y - z &= 7 \end{aligned}$
3	$\begin{aligned} x + y + z &= 4 \\ 2x - y - 3z &= 8 \\ 4x + 3y - z &= 26 \end{aligned}$	4	$\begin{aligned} 5x - 2y - 3z &= 8 \\ 6x + 4y + 2z &= 0 \\ -2x - 4y - 3z &= 4 \end{aligned}$
5	$\begin{aligned} x - y - z &= -5 \\ 4x - y + 3z &= -11 \\ -2x + 3y - z &= 13 \end{aligned}$	6	$\begin{aligned} 2x - y - z &= 5 \\ -x + 2y + z &= -5 \\ x - 3y - 2z &= 8 \end{aligned}$
7	$\begin{aligned} -2x + 3y - z &= -3 \\ 6x - 9y + 3z &= 10 \\ -4x + 6y - 2z &= 2 \end{aligned}$	8	$\begin{aligned} 4x + 3y - 2z &= 7 \\ 2x + z &= -3 \\ 3y - 4z &= 13 \end{aligned}$
9	$\begin{aligned} 3x - 2y + z &= 10.5 \\ 4x + y - 3z &= 4.5 \\ 7x + 2y - 4z &= 8 \end{aligned}$	10	$\begin{aligned} x + y &= 5 \\ 3x + 4y - z &= 8 \\ -x + 2y - 3z &= -1 \end{aligned}$

A	The equations are consistent with one solution. The three planes meet at a point.	B	The equations are consistent with infinitely many solutions. The three planes form a sheaf.
C	The equations are inconsistent and have no solutions. The three planes form a prism.	D	The equations are inconsistent and have no solutions. Two or more of the planes are parallel.