

Crack the Code

Vector Equation of a Plane

A	<p>The plane containing the point $(1, 3, 2)$ with normal vector $7\mathbf{i} - 3\mathbf{j} + 10\mathbf{k}$ has the Cartesian equation</p> $7x - 3y + \boxed{10}z = \boxed{18}$	B	<p>The plane containing the point $(5, -1, 3)$ and the direction vectors $3\mathbf{i} + 4\mathbf{j} - 2\mathbf{k}$ and $-4\mathbf{i} + 9\mathbf{j} - \mathbf{k}$ has the equation</p> $\mathbf{r} = \begin{pmatrix} 5 \\ -1 \\ \boxed{3} \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ \boxed{4} \\ -2 \end{pmatrix} + \mu \begin{pmatrix} -4 \\ 9 \\ \boxed{-1} \end{pmatrix}$
C	<p>The plane with normal vector $3\mathbf{i} + 5\mathbf{j} - 8\mathbf{k}$ that passes through the point $(-1, 4, \boxed{6})$ has Cartesian equation</p> $\boxed{3}x + 5y - 8z + 31 = 0$	D	<p>The plane with Cartesian equation $\boxed{5}x - 2y + 7z = 3$ has a normal vector $5\mathbf{i} - 2\mathbf{j} + \boxed{7}\mathbf{k}$</p>
E	<p>The point $(1, \boxed{6}, 8)$ lies on the plane with equation</p> $\mathbf{r} = \begin{pmatrix} 4 \\ -3 \\ 2 \end{pmatrix} + \lambda \begin{pmatrix} -2 \\ 5 \\ 0 \end{pmatrix} + \mu \begin{pmatrix} 1 \\ -1 \\ 6 \end{pmatrix}$	F	<p>The point $(\boxed{9}, -1, -5)$ lies on the plane with Cartesian equation $5x - 3y + z = 43$</p>
G	<p>The plane with equation $\mathbf{r} = \begin{pmatrix} 6 \\ -2 \\ -1 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ 4 \\ -2 \end{pmatrix} + \mu \begin{pmatrix} -1 \\ 1 \\ 2 \end{pmatrix}$ has a normal vector $10\mathbf{i} - \boxed{4}\mathbf{j} + \boxed{7}\mathbf{k}$</p>	H	<p>The equation of the plane which contains the point $(4, 1, -1)$ and is parallel to the plane with equation $5x + 6y - 2z = 5$ is</p> $\boxed{5}x + 6y - \boxed{2}z = \boxed{28}$
I	<p>An equation of the plane that contains the points $(8, 0, 4)$, $(1, 2, -2)$ and $(-3, 1, 5)$ is</p> $\mathbf{r} = \begin{pmatrix} 8 \\ 0 \\ 4 \end{pmatrix} + \lambda \begin{pmatrix} -7 \\ \boxed{2} \\ 6 \end{pmatrix} + \mu \begin{pmatrix} \boxed{11} \\ -1 \\ -1 \end{pmatrix}$	J	<p>The Cartesian equation of the plane that passes through $(0, 0, 0)$, $(3, 2, -4)$ and $(-5, 1, 1)$ is</p> $6x + \boxed{17}y + \boxed{13}z = 0$

To get the three-digit code, add together all the numbers in the boxes. **159**