

Match-Up

Angles Between Lines and Planes

1	Find the size of the acute angle between the lines with equations $\mathbf{r} = 2\mathbf{i} + 3\mathbf{j} + \mathbf{k} + \lambda(4\mathbf{i} - \mathbf{j} + 3\mathbf{k})$ and $\mathbf{r} = -\mathbf{i} + 5\mathbf{j} + 6\mathbf{k} + \lambda(-2\mathbf{i} - 3\mathbf{j} + 7\mathbf{k})$	A	46.3°
2	Find the size of the acute angle between the line $\mathbf{r} = \begin{pmatrix} 6 \\ 0 \\ -5 \end{pmatrix} + \lambda \begin{pmatrix} 3 \\ -2 \\ 5 \end{pmatrix}$ and the plane $\mathbf{r} \cdot \begin{pmatrix} -2 \\ 2 \\ 3 \end{pmatrix} = 6$	B	78.5°
3	Find the size of the acute angle between the lines with equations $\mathbf{r} = \begin{pmatrix} 1 \\ 2 \\ -3 \end{pmatrix} + \lambda \begin{pmatrix} 4 \\ 4 \\ -1 \end{pmatrix}$ and $\mathbf{r} = \begin{pmatrix} 2 \\ -5 \\ 1 \end{pmatrix} + \lambda \begin{pmatrix} 0 \\ -7 \\ 4 \end{pmatrix}$	C	62.3°
4	Find the acute angle between the planes with Cartesian equations $3x + y + 5z = 9$ and $x - 4y + 3z = 6$	D	31.9°
5	Find the acute angle between the line with equation $\mathbf{r} = \begin{pmatrix} 3 + \lambda \\ -1 + 2\lambda \\ 5 - 6\lambda \end{pmatrix}$ and the plane $5x - y + 2z = 11$	E	66.5°
6	Find the acute angle between the lines with equations $\frac{x+2}{3} = \frac{y-1}{-2} = \frac{z}{-4}$ and $\frac{x+1}{6} = y - 2 = \frac{z-4}{-5}$	F	50.6°
7	Find the acute angle between the planes with equations $\mathbf{r} \cdot \begin{pmatrix} -1 \\ 6 \\ 2 \end{pmatrix} = 11$ and $\mathbf{r} \cdot \begin{pmatrix} 4 \\ -3 \\ 6 \end{pmatrix} = -1$	G	11.3°
8	Find the acute angle between the plane $x - y + 4z = 2$ and the line $\frac{1-x}{4} = \frac{y+7}{2} = \frac{z+3}{5}$	H	14.9°

1	2	3	4	5	6	7	8
E	G	A	C	H	D	B	F