Part 2 intersection of planes and lines – exploring with cleARmaths

1. How many common points are shared by these objects?

Try to imagine the number of common points and then check your answer using the cleARmaths app

a) line – line

$$g: \vec{x} = \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix} + t \cdot \begin{pmatrix} -1 \\ 5 \\ 3 \end{pmatrix}, \qquad h: \vec{x} = \begin{pmatrix} -1 \\ -8 \\ -7 \end{pmatrix} + t \cdot \begin{pmatrix} 2 \\ 2 \\ 2 \end{pmatrix}$$

☐ zero ☒ one ☐ two ☐ infinite

b) line – plane

$$g: \vec{x} = \begin{pmatrix} 1 \\ 3 \\ 1 \end{pmatrix} + t \cdot \begin{pmatrix} 3 \\ 4 \\ 5 \end{pmatrix}, \qquad E: \vec{x} = \begin{pmatrix} -1 \\ 3 \\ -1 \end{pmatrix} + t \cdot \begin{pmatrix} 5 \\ 4 \\ 3 \end{pmatrix} + s \cdot \begin{pmatrix} -2 \\ 1 \\ 0 \end{pmatrix}$$

☐ zero ☒ one ☐ two ☐ infinite

c) plane – plane

$$E_1: \vec{x} = \begin{pmatrix} 4 \\ 7 \\ 10 \end{pmatrix} + t \cdot \begin{pmatrix} 1 \\ -1 \\ -1 \end{pmatrix} + s \cdot \begin{pmatrix} 4 \\ 1 \\ -2 \end{pmatrix}, \qquad E_2: \vec{x} = \begin{pmatrix} 0 \\ 7 \\ 8 \end{pmatrix} + t \cdot \begin{pmatrix} -2 \\ -1 \\ 1 \end{pmatrix} + s \cdot \begin{pmatrix} 3 \\ 0 \\ 2 \end{pmatrix}$$

☐ zero ☐ one ☐ two ☒ infinite

cleARmaths