# Exercise 1

Paper 1 style · No calculator

## 1 6 marks AHL 3.14 · 3.15 ●○○ Routine

The line $L$ passes through the points $A(2, 0, -1)$ and $B(4, -1, 2)$.

**(a)** Find a vector equation of $L$. **[2]**

**(b)** Show that the point $C(8, -3, 8)$ lies on $L$. **[2]**

**(c)** Find the coordinates of the point where $L$ meets the plane $x = 0$. **[2]**

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**MARKSCHEME (a)**

$\overrightarrow{AB} = \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$ **A1**

$\mathbf{r} = \begin{pmatrix} 2 \\ 0 \\ -1 \end{pmatrix} + \lambda \begin{pmatrix} 2 \\ -1 \\ 3 \end{pmatrix}$ **A1**

**Total 2 marks**

**MARKSCHEME (b)**

$2 + 2\lambda = 8 \Rightarrow \lambda = 3$ **M1**

$y = 0 - 3 = -3,\ z = -1 + 9 = 8$, so $C$ is on $L$ **R1**

**Total 2 marks**

**Note** AG.

**MARKSCHEME (c)**

$2 + 2\lambda = 0 \Rightarrow \lambda = -1$ **M1**

$(0,\ 1,\ -4)$ **A1**

**Total 2 marks**