

Question	Scheme	Marks	AOs
8	$2 + 4\lambda - 2(4 - 2\lambda) - 6 + \lambda = 6 \Rightarrow \lambda = \dots$	M1	1.1b
	$\lambda = 2 \Rightarrow$ Required point is $(2 + 2(4), 4 + 2(-2), -6 + 2(1))$ $(10, 0, -4)$	A1	1.1b
	$2 + t - 2(4 - 2t) - 6 + t = 6 \Rightarrow t = \dots$	M1	3.1a
	$t = 3$ so reflection of $(2, 4, -6)$ is $(2 + 6(1), 4 + 6(-2), -6 + 6(1))$ $(8, -8, 0)$	M1	3.1a
		A1	1.1b
	$\begin{pmatrix} 10 \\ 0 \\ -4 \end{pmatrix} - \begin{pmatrix} 8 \\ -8 \\ 0 \end{pmatrix} = \begin{pmatrix} 2 \\ 8 \\ -4 \end{pmatrix}$	M1	3.1a
	$\mathbf{r} = \begin{pmatrix} 10 \\ 0 \\ -4 \end{pmatrix} + k \begin{pmatrix} 1 \\ 4 \\ -2 \end{pmatrix}$ or equivalent e.g. $\left( \mathbf{r} - \begin{pmatrix} 10 \\ 0 \\ -4 \end{pmatrix} \right) \times \begin{pmatrix} 1 \\ 4 \\ -2 \end{pmatrix} = \mathbf{0}$	A1	2.5
	(7)		

(7 marks)

**Notes:**

**M1:** Substitutes the parametric equation of the line into the equation of the plane and solves for  $\lambda$

**A1:** Obtains the correct coordinates of the intersection of the line and the plane

**M1:** Substitutes the parametric form of the line perpendicular to the plane passing through  $(2, 4, -6)$  into the equation of the plane to find  $t$

**M1:** Find the reflection of  $(2, 4, -6)$  in the plane

**A1:** Correct coordinates

**M1:** Determines the direction of  $l$  by subtracting the appropriate vectors

**A1:** Correct vector equation using the correct notation

