

## 5.7 Intersections I

### Intersection between a Line and a Plane.

Lines and Planes can have 0, 1, or infinite solutions depending on whether they are parallel, intersecting or coincident

$$L : \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 3 \\ 1 \\ 2 \end{bmatrix} + t \begin{bmatrix} 1 \\ -4 \\ -8 \end{bmatrix}$$

Ex 1 Determine the point of intersection of the line  
 $\pi : 4x + 2y - z - 8 = 0$

### Intersection between Two Lines

2 Lines can have 0, 1, or infinite solutions depending on whether they are parallel/skew, intersecting or coincident.

Ex 2 Determine the point of intersection of  $x = 1 + s$ ,  $y = 3 + 4s$ ,  $z = 6 + 5s$  and  
 $x = 4 - t$ ,  $y = 17 + 2t$ ,  $z = 30 - 3t$

p.343#1

2 planes:p.358# 1c,2