Example 1. Find a vector equation for the line through (-1, 2, 3) and (2, -2, 5).

Example 2. Find a vector equation for the line through (5, -6, 7) that is parallel to the line with parametric equations x = 1 + t, y = 2, z = 3 + 2t.

Example 3. Find the point of intersection of the lines from Examples 1 and 2.

Example 4. Show that the lines

$$\begin{array}{ll} L_1: & \langle 1+t, -3-t, 5+2t \rangle \\ L_2: & \langle 4-s, -3+s, 6+2s \rangle \end{array}$$

are *skew* (i.e. neither parallel nor intersecting).

Example 5. Find an equation for the plane containing the points (1, 2, 3), (-2, 4, 1) and (0, 6, -2).

Example 6. Show that the planes 2x - 5y + 9z = 6 and 4x - 10y + 11z = 0 are not parallel. Find parametric equations for their line of intersection.

Example 7. Find a formula for the (perpendicular) distance from the point (x_1, y_1, z_1) to the plane with equation ax + by + cz + d = 0.

Example 8. Find the distance between the lines of Example 4.