

EE112 – Engineering Mathematics II

Problem Set 6

Due by 5pm on Friday, 16 March 2018

1. Each of the following pairs of points defines a line. For each case, find an equation for the line in vector form, parametric form and symmetric form.
 - (a) Line 1 contains $(1, 2, 0)$ and $(-1, 1, 2)$.
 - (b) Line 2 contains $(3, 1, -2)$ and the origin.
 - (c) Line 3 contains $(0, -0.5, 0)$ and $(1, 1, 1.5)$.
2. (a) Given the information below, find the equations for the following two planes:
 - (i) Plane 1 contains the origin, $(3, 2, 1)$ and $(1, 1, -1)$.
 - (ii) Plane 2 is normal to the vector $2\hat{i} - 5\hat{j} + 3\hat{k}$ and contains the point $(-1, 0, 4)$.(b) Determine if either Plane 1 or Plane 2 (or both) contains the point $(3, -2, -2)$.
3. Plane 3 and Plane 4 are given, respectively, by the equations $-x + 2y - z = 0$ and $y - z = 1$.
 - (a) Find the parametric form of the line which is perpendicular to Plane 4 and contains the point $(0, -1, 0)$, and then determine where that line intersects Plane 3.
 - (b) Find the equation for the line of intersection between Plane 3 and Plane 4, expressed in whichever form you like (i.e vector, parametric or symmetric).