

Course 2E02 2011 (SF Engineers & MSISS & MEMS)**S h e e t 3**

Due: at the end of the tutorial

Exercise 1

- (i) Find parametric equations for the line spanned by the vector:

$$\mathbf{u} = (1, 2, -5);$$

- (ii) Give two equations that determine the line in (i).
(iii) Find an equation for the plane spanned by the vectors:

$$\mathbf{u} = (1, 1, -1), \quad \mathbf{v} = (-1, 0, 1).$$

Exercise 2

Which of the following sets of vectors are linearly dependent?

- (i) $(0, 1), (0, -2)$;
(ii) $(0, -1, 1), (1, -1, 0), (1, 1, 1)$;
(iii) $(0, 0, 1, 0, 0), (1, 1, -1, 1, 1), (1, 1, 0, 1, 1)$.

Exercise 3

Which of the following sets of vectors are bases for the corresponding space \mathbb{R}^n ? (The dimension n should be clear from the length of vectors.)

- (i) $(-1, -1)$;
(ii) $(0, 1), (1, 1)$;
(iii) $(-2, 2), (3, -3)$;
(iv) $(1, 1), (5, -2), (-1, 1)$;
(v) $(1, 1, 1, 0), (0, 1, 3, 3), (1, 3, 2, 1)$;
(vi) $(2, 0, 1), (0, 2, 0), (2, 1, 1)$.