October 8, 2018 Lecturer Dmitri Zaitsev

Course 2E01 2018 (SF Engineers & MSISS & MEMS)

S h e e t 4

Due: at the end of the tutorial

Exercise 1

Find an equation for the plane generated (spanned) by the vectors:

$$\mathbf{u} = (1, 1, -2), \quad \mathbf{v} = (-1, -3, 0).$$

Exercise 2

Determine whether the vectors span $\mathbb{R}^3$:

(i) $\mathbf{v}_1 = (3, -1, 2)$, $\mathbf{v}_2 = (2, 2, -4)$, $\mathbf{v}_3 = (2, 0, 0)$;

Determine whether the vectors span $\mathbb{R}^2$:

(ii) $\mathbf{v}_1 = (1, -2)$, $\mathbf{v}_2 = (1, -1)$, $\mathbf{v}_3 = (-1, 1)$.

Exercise 3

Which of the following sets of vectors are linearly dependent?

(i) $(1, 1)$, $(-1, 1)$;

(ii) $(0, 1, -1)$, $(1, -1, 0)$, $(-2, 0, 2)$;

(iii) $(1, 0, 1, 0, 0)$, $(0, 1, 3, 1, 1)$, $(0, -2, 0, 0, 1)$.