

Course 2E01 2018 (SF Engineers & MSISS & MEMS)**S h e e t 1**

Due: at the end of the tutorial

Exercise 1

Find $\mathbf{v} + \mathbf{u}$, $-2\mathbf{v}$, the length $\|\mathbf{u}\|$, $\|\mathbf{v}\|$, the dot product $\mathbf{u} \cdot \mathbf{v}$, the angle between \mathbf{u} and \mathbf{v} and determine whether \mathbf{u} and \mathbf{v} are orthogonal (or for which values of parameters \mathbf{u} and \mathbf{v} are orthogonal, if any are present):

- (i) $\mathbf{u} = (1, 0, 1)$, $\mathbf{v} = (2, 1, -1)$;
- (ii) $\mathbf{u} = (1, 0, 0, 1, 0, 1)$, $\mathbf{v} = (0, -2, 0, 0, -1, 1)$;
- (iii) $\mathbf{u} = (-2, k, 0, k)$, $\mathbf{v} = (0, 2k, -k^2, 4)$;

Exercise 2

Write the system in the matrix form:

(i)

$$\begin{cases} x + 2z - y = -2 \\ -z + x = -13 \end{cases}$$

(ii)

$$\begin{cases} 2x - z + 14t = -1 \\ t - 2y = -7 \\ 3y + z - x = -2 \end{cases}$$