Course 2E02 2013 (SF Engineers & MSISS & MEMS)

Sheet 6

Due: at the end of the tutorial

Exercise 1

Calculate the coordinates of \mathbf{v} relative to the orthogonal basis

$$\{(-1,0,0), (0,1,-2), (0,2,1)\}:$$

(i) $\mathbf{v} = (2, -1, -3);$ (ii) $\mathbf{v} = (-1, -1, 1).$

Exercise 2

Use the Gram-Schmidt process to transform the given basis into orthogonal one:

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

Exercise 3

Find the least squares approximate solution of the linear system:

$$\begin{cases} x = 1 \\ y = 0 \\ y + z = 1 \\ x + y + z = 0 \end{cases}$$