COMP110 EXERCISE SHEET IV: VECTORS

Version 1.0
BSc Computing for Games
COMP110

Ed Powley

To complete this worksheet:

- **complete** the following problems using **pen and paper**; and
- **hand in** your solutions in the COMP110 workshop session in week 12.

1. Calculate the following vectors:
   (a) $\begin{pmatrix} 9 \\ 6 \end{pmatrix} + \begin{pmatrix} 4 \\ 6 \end{pmatrix}$
   (b) $\begin{pmatrix} -8 \\ 0 \end{pmatrix} + \begin{pmatrix} 6 \\ 9 \end{pmatrix}$
   (c) $\begin{pmatrix} 6 \\ -10 \end{pmatrix} - \begin{pmatrix} -9 \\ 2 \end{pmatrix}$
   (d) $4 \times \begin{pmatrix} 2 \\ 1 \end{pmatrix} + 8 \times \begin{pmatrix} 3 \\ 1 \end{pmatrix}$
   (e) $2 \times \begin{pmatrix} 2 \\ 6 \end{pmatrix} - 8 \times \begin{pmatrix} 6 \\ 1 \end{pmatrix}$
2. Find the magnitudes of the following vectors, giving your answers to 2 decimal places:
   (a) $\begin{pmatrix} 3 \\ 3 \end{pmatrix}$
   (b) $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$
   (c) $\begin{pmatrix} 3 \\ -19 \end{pmatrix}$
   (d) $\begin{pmatrix} -19 \\ -20 \end{pmatrix}$
   (e) $\begin{pmatrix} -11 \\ -8 \end{pmatrix}$
3. Find the distances between the following pairs of points, giving your answers to 2 decimal places:
   (a) $\begin{pmatrix} 10 \\ 5 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$
   (b) $\begin{pmatrix} -5 \\ -8 \end{pmatrix}$ and $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$
   (c) $\begin{pmatrix} 1 \\ 13 \end{pmatrix}$ and $\begin{pmatrix} -4 \\ 16 \end{pmatrix}$
   (d) $\begin{pmatrix} 9 \\ -18 \end{pmatrix}$ and $\begin{pmatrix} -16 \\ -12 \end{pmatrix}$
   (e) $\begin{pmatrix} -6 \\ -4 \end{pmatrix}$ and $\begin{pmatrix} -3 \\ 0 \end{pmatrix}$