Leave blank

2. [*In this question* **i** *and* **j** *are horizontal unit vectors due east and due north respectively and position vectors are given relative to a fixed origin O.*]

At time $t = 0$, a bird A leaves its nest, that is located at the point with position vector $(20\mathbf{i} - 17\mathbf{j})$ m, and flies with constant velocity $(-6\mathbf{i} + 7\mathbf{j})\,\text{m s}^{-1}$. At the same time a second bird B leaves its nest which is located at the point with position vector $(-8\mathbf{i} + 9\mathbf{j})$ m and flies with constant velocity $(p\mathbf{i} + 2p\mathbf{j})\,\text{m s}^{-1}$, where p is a constant. At time $t = 4$ s, bird B is south west of bird A.

(a) Find the direction of motion of A, giving your answer as a bearing to the nearest degree.

(3)

(b) Find the speed of B.

(10)

Leave blank

Question 2 continued

Leave blank

Question 2 continued

Leave blank

Question 2 continued

(Total 13 marks)

Q2