2. A particle, P, moves with constant acceleration $(3\mathbf{i} + 4\mathbf{j})$ m s^{-2}.

At time $t = 0$, the particle is at the point A and is moving with velocity $(-7\mathbf{i} + \mathbf{j})$ m s^{-1}.

At time $t = T$ seconds, P is moving in the direction of vector $(2\mathbf{i} + 3\mathbf{j})$.

(a) Find the value of T.

(4)

At time $t = 4$ seconds, P is at the point B.

(b) Find the distance AB.

(2)

(Total for Question 2 is 6 marks)