Vectors – A2 Mathematics P2

1. June/2022/Paper_7357/02/No.16

Two particles, P and Q, move in the same horizontal plane.

Particle P is initially at rest at the point with position vector $(-4\mathbf{i} + 5\mathbf{j})$ metres and moves with constant acceleration $(3\mathbf{i} - 4\mathbf{j})\,\mathrm{m\,s^{-2}}$

Particle Q moves in a straight line, passing through the points with position vectors $(\mathbf{i} - \mathbf{j})$ metres and $(10\mathbf{i} + c\mathbf{j})$ metres.

P and Q are moving along parallel paths.

(a) Show that $c = -13$

[4 marks]

(b) (i) Find an expression for the position vector of P at time t seconds.

[1 mark]

(b) (ii) Hence, prove that the paths of P and Q are not collinear.

[3 marks]