9 The particle M is moving along the straight line PQ with a constant acceleration of 2 m/s^2.

At time $t = 0$, M is at the point P moving with velocity 6 m/s towards Q.

(a) Find an expression for the velocity of M at time t seconds.

(2)

(b) Show that the displacement of M from P at time t seconds is $(t^2 + 6t)$ metres.

(2)

A second particle N is moving along PQ. The acceleration of N at time t seconds is $6t$ m/s^2.
At time $t = 0$, N is stationary at the point P.

(c) Find an expression for the velocity of N at time t seconds.

(2)

(d) Find an expression for the displacement of N from P at time t seconds.

(2)

(e) Find the distance between M and N at time $t = 5$ seconds.

(2)

(f) Find the value of t, $t > 0$, when the two particles meet.

(3)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 13 marks)