DIFFERENTIATION

DISPLACEMENT, VELOCITY AND ACCELERATION

Ref: G704. 1R1

A1 The displacement of a particle is given by $s = 3t^2 + 5t + 1$ Find an expression for the velocity at time t.	**A2** The displacement of a particle is given by $s = 2t^3 + 4t + 5$ Find an expression for the velocity at time t.	**A3** The displacement of a particle is given by $s = 5t^3 + 3t - 2$ Find an expression for the acceleration at time t.	**A4** The velocity of a particle is given by $v = t^3 - 3t^2 - 2$ Find an expression for the acceleration at time t.
B1 The displacement of a particle is given by $s = 2t^2 + t - 3$ Find the velocity when $t = 2$	**B2** The displacement of a particle is given by $s = t^3 - 2t^2 + 2$ Find the velocity when $t = 2.5$	**B3** The velocity of a particle is given by $v = 6t^2 - 5t$ Find the acceleration when $t = 3$	**B4** The displacement of a particle is given by $s = t^4 + 4t + 7$ Find the acceleration when $t = 1.5$
C1 The displacement of a particle is given by $s = 4t^2 - 3t + 6$ Find the time at which the velocity is 5 m/s	**C2** The displacement of a particle is given by $s = t^3 - 1.5t^2 - 6t$ Find the time at which the velocity of the particle is zero.	**C3** The displacement of a particle is given by $s = 2t^3 - 5t^2 - 3t$ Find the time at which the acceleration of the particle is zero	**C4** The displacement of a particle is given by $s = t^3 - t^2 + t - 1$ Find the time at which the acceleration of the particle is 15 m/s^2
D1 The displacement of a particle is given by $s = 3t^3 - 7.5t^2 - 6t + 5$ Find the acceleration when the velocity is zero.	**D2** The displacement of a particle is given by $s = 2t^3 - 4t^2 + 7$ Find the time at which the velocity equal to the acceleration.	**D3** The displacement of a particle is given by $s = 4t^3 + t^2 + 2t$ Find the acceleration when the velocity is 20 metres.	**D4** The velocity of a particle is given by $v = 6t^2 + 7$ Find a possible expression for the displacement at time t.