Exercise 1

Paper 1 style · No calculator

1 5 marks SL 5.9 ●○○ Routine

A particle moves in a straight line with velocity $v(t) = 6t^2 - 4t$ m s^{-1}. At $t = 0$ its displacement from O is 1 m.

(a) Find an expression for the displacement $s(t)$. **[3]**

(b) Find the displacement when $t = 2$. **[1]**

(c) Find the acceleration when $t = 2$. **[1]**

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MARKSCHEME (a)

$s(t) = 2t^3 - 2t^2 + c$ **A1A1**

$s(0) = 1$: $s(t) = 2t^3 - 2t^2 + 1$ **A1**

Total 3 marks

MARKSCHEME (b)

$s(2) = 16 - 8 + 1 = 9$ m **A1**

Total 1 mark

MARKSCHEME (c)

$a(t) = 12t - 4$: $a(2) = 20$ m s^{-2} **A1**

Total 1 mark