HIGHER

5.2 Calculus in Kinematics: Displacement, Velocity and Acceleration: 10-minute Pack

EDEXCEL 4MA1 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A particle moves in a straight line. At time t seconds its velocity is v = -8t + 8 m/s. When t = 0 the particle is -1 m from a fixed point O.
Find the displacement of the particle from O when t = 4.

(Total for Question 1 is 4 marks)

---

2 A particle moves in a straight line. Its displacement s metres from a fixed point O after t seconds is $s = t^4 + t^3 + 3t^2 - 2t$.
Find the velocity of the particle when t = 2.

(Total for Question 2 is 2 marks)

---

3 A particle moves in a straight line. Its displacement s metres from a fixed point O after t seconds is $s = 2t^2 - 3t$.
Find the velocity of the particle when t = 4.

(Total for Question 3 is 2 marks)

© Revision Library | revisionlibrary.co.uk

Mark scheme · 5.2 Calculus in Kinematics: Displacement, Velocity and Acceleration: 10-minute Pack

Question 1

integrates the velocity expression with respect to t	**M1**
$s = -4t^2 + 8t + c$ with all terms correct	**A1**
uses $s = -1$ when $t = 0$ to find $c = -1$	**M1**
$s = -33$ m cao	**A1**

Answer: $s = -33$ m

Question 2

$v = ds/dt = 4t^3 + 3t^2 + 6t - 2$	**M1**
$v = 54$ m/s cao	**A1**

Answer: $v = 54$ m/s

Question 3

$v = ds/dt = 4t - 3$	**M1**
$v = 13$ m/s cao	**A1**

Answer: $v = 13$ m/s

© Revision Library | revisionlibrary.co.uk