



DIFFERENTIATION

DISPLACEMENT, VELOCITY AND ACCELERATION

Ref: G989. **7R4**

101.0707.111			
A1	A2	A3	A4
The displacement of a particle is	The displacement of a particle is	The displacement of a particle is	The velocity of a particle is
given by $s = 3t^2 + 5t + 1$	given by $s = 2t^3 + 4t + 5$	given by $s = 5t^3 + 3t - 2$	given by $v = t^3 - 3t^2 - 2$
Find an expression for	Find an expression for	Find an expression for	Find an expression for
the velocity at time <i>t</i> .	the velocity at time t.	the acceleration at time t .	the acceleration at time t .
B1	B2	В3	B4
The displacement of a particle is	The displacement of a particle is	The velocity of a particle is	The displacement of a particle is
given by	given by	given by	given by
$s = 2t^2 + t - 3$	$s = t^3 - 2t^2 + 2$	$v = 6t^2 - 5t$	$s = t^4 + 4t + 7$
Find the velocity when $t = 2$	Find the velocity when $t = 2.5$	Find the acceleration when $t = 3$	Find the acceleration when $t = 1.5$
C1	C2	C3	C4
The displacement of a particle is	The displacement of a particle is	The displacement of a particle is	The displacement of a particle is
given by	given by	given by	given by
$s = 4t^2 - 3t + 6$	$s = t^3 - 1.5t^2 - 6t$	$s = 2t^3 - 5t^2 - 3t$	$s = t^3 - t^2 + t - 1$
Find the time at which the	Find the time at which the	Find the time at which the	Find the time at which the
velocity is 5 m/s	velocity of the particle is zero.	acceleration of the particle is zero	acceleration of the particle is 15 m/s ²
D1	D2	D3	D4
The displacement of a particle is	The displacement of a particle is	The displacement of a particle is	The velocity of a particle is
given by	given by	given by	given by
$s = 3t^3 - 7.5t^2 - 6t + 5$	$s = 2t^3 - 4t^2 + 7$	$s = 4t^3 + t^2 + 2t$	$v = 6t^2 + 7$
Find the acceleration when the	Find the time at which the velocity	Find the acceleration when the	Find a possible expression for the
velocity is zero.	is equal to the acceleration.	velocity is 20 metres.	displacement at time t.
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The displacement of a particle is

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A1

given by

$$V = 6t + 5$$

 $V = 6t^2 + 4$ A2 The displacement of a particle is given by

$$s = 2t^3 + 4t + 5$$

Find an expression for the velocity at time t.

 $s = 3t^2 + 5t + 1$

$$s = 2t^3 + 4t + 5$$

Find an expression for the velocity at time t.

A3

a = 30tThe displacement of a particle is

given by

$$s = 5t^3 + 3t - 2$$

Find an expression for the acceleration at time t. A4

$$a = 3t^2 - 6t$$

The velocity of a particle is given by

$$v = t^3 - 3t^2 - 2$$

Find an expression for the acceleration at time t.

B1

$$V = 9 \, \text{ms}^{-1}$$

The displacement of a particle is given by

$$s = 2t^2 + t - 3$$

Find the velocity when t = 2

$$V = 8.75 \,\mathrm{ms}^{-1}$$

The displacement of a particle is given by

$$s = t^3 - 2t^2 + 2$$

Find the velocity when t = 2.5

B3

$$a = 31 \text{ ms}^{-2}$$

The velocity of a particle is given by

$$v = 6t^2 - 5t$$

Find the acceleration when t = 3

$a = 27 \text{ ms}^{-2}$

The displacement of a particle is given by

$$s = t^4 + 4t + 7$$

Find the acceleration when t = 1.5

C1

t=1 second

The displacement of a particle is given by

$$s = 4t^2 - 3t + 6$$

Find the time at which the velocity is 5 m/s

D1

$a = 21 \text{ ms}^{-2}$

The displacement of a particle is given by

$$s = 3t^3 - 7.5t^2 - 6t + 5$$

Find the acceleration when the velocity is zero.

t=2 seconds

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.

D2

t = 0.465, t = 2.87

The displacement of a particle is given by

$$s = 2t^3 - 4t^2 + 7$$

Find the time at which the velocity is equal to the acceleration.

C3

t = 0.83 seconds

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

D3

$a = 29.5 \,\mathrm{ms}^{-2}$

The displacement of a particle is given by

$$s = 4t^3 + t^2 + 2t$$

Find the acceleration when the velocity is 20 metres.

C4

t = 2.83 seconds

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/s²

D4

$s = 2t^3 + 7t \pm anything$

The velocity of a particle is given by

$$v = 6t^2 + 7$$

Find a possible expression for the displacement at time t.