**Using Differentiation**

$s$ (displacement)

$v$ (velocity)

$a$ (acceleration)

**Example**

A body moves in a straight line such that $v = 2t^{2} - 11t + 14$. Initially (i.e. when $t = 0$), the displacement of the body from some fixed point O on the line is 50m. Find:

a) The initial velocity of the body

b) The values of t when the body is at rest

c) The acceleration of the body when t = 5s

d) The displacement of the body when t = 6s (we cover integration later in the chapter)

**Test Your Understanding**

Pudding the Cat’s displacement from a house, in metres, is $t^{3}-\frac{3}{2}t^{2}-36t$ where $t$ is in seconds.

(a) Determine the velocity of the cat when $t=2$.

(b) At what time will the cat be instantaneously at rest?

(c) What is the cat’s acceleration after 5 seconds?

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