

- 8 A particle  $P$  is moving along the positive  $x$ -axis. At time  $t$  seconds ( $t \geq 0$ ), the acceleration  $a \text{ m/s}^2$  of  $P$  is given by  $a = 6 - 4t$

When  $t = 0$ ,  $P$  is at rest and the displacement of  $P$  from the origin  $O$  is 5 metres.

At time  $t$  seconds, the velocity of  $P$  is  $v \text{ m/s}$  and the displacement of  $P$  from  $O$  is  $s$  metres.

- (a) Find, in terms of  $t$ , an expression for

(i)  $v$

(ii)  $s$

(6)

For  $t > 0$ ,  $P$  comes to instantaneous rest at the point  $A$ .

- (b) Find

(i) the value of  $t$  when  $P$  reaches  $A$ ,

(ii) the distance  $OA$ .

(5)

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**Question 8 continued****(Total for Question 8 is 11 marks)**

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