**8** A particle $P$ is moving along the positive $x$-axis. At time $t$ seconds ($t \geqslant 0$), the acceleration $a$ 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 $v$ 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)**

**Question 8 continued**

**Question 8 continued**

**Question 8 continued**

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