

3 A particle P moves along the x -axis.

At time t seconds ($t \geq 0$) the acceleration, $a \text{ m/s}^2$, of P is given by $a = 6t - 16$

When $t = 0$, P is at the origin and is moving with velocity 12 m/s .

(a) Find an expression in terms of t for

(i) the velocity of P at time t seconds

(ii) the displacement of P at time t seconds.

(4)

(b) Hence find the time at which P first returns to the origin.

(3)

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Question 3 continued

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(Total for Question 3 is 7 marks)

