

Question 19**(8 marks)**

The displacement in centimetres of a particle from the point O in a straight line is given by

$$x(t) = \frac{1}{3} \left(\frac{t}{2} - 4 \right)^2 - 2 \quad \text{for } 0 \leq t \leq 10, \text{ where } t \text{ is measured in seconds.}$$

Calculate the:

(a) time(s) that the particle is at rest. (2 marks)

(b) displacement of the particle during the fifth second. (2 marks)

(c) maximum speed of the particle and the time when this occurs. (2 marks)

(d) total distance travelled in the first 10 seconds. (2 marks)