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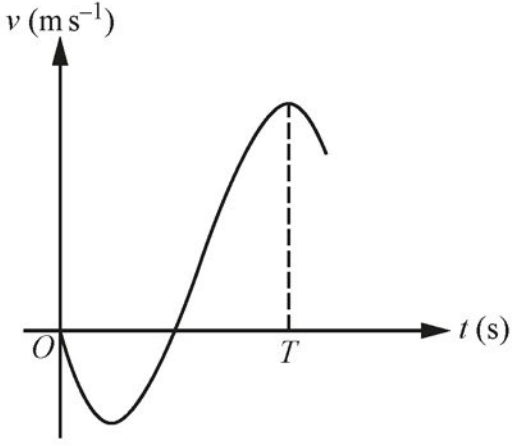

A particle P moves along the x-axis. At time t seconds, where $t \geqslant 0$, the velocity of P in the positive x-direction is $v\,\text{m s}^{-1}$. It is given that $v = t(t-3)(8-t)$.

P attains its maximum velocity at time T seconds. The diagram shows part of the velocity-time graph for the motion of P.

(a) State the acceleration of P at time T. **[1]**

(b) In this question you must show detailed reasoning.

Determine the value of T. **[5]**

(c) Find the total distance that P travels between times $t = 0$ and $t = T$. **[3]**