**3.** A particle $P$ of mass $m$kg is initially held at rest at the point $O$ on a smooth inclined plane. The plane is inclined at an angle $\alpha$ to the horizontal, where $\sin\alpha = \frac{2}{5}$

The particle is released from rest and slides down the plane against a force which acts towards $O$. The force has magnitude $\frac{1}{3}mx^2$ N, where $x$ metres is the distance of $P$ from $O$.

(a) Find the speed of $P$ when $x = 2$

**(6)**

The particle first comes to instantaneous rest at the point $A$.

(b) Find the distance $OA$.

**(2)**

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