**5** A particle $P$ is moving along a straight line with acceleration $3ku - kv$ where $v$ is its velocity at time $t$, $u$ is its initial velocity and $k$ is a constant. The velocity and acceleration of $P$ are both in the direction of increasing displacement from the initial position.

**(a)** Find the time taken for $P$ to achieve a velocity of $2u$. [3]

**(b)** Find an expression for the displacement of $P$ from its initial position when its velocity is $2u$. [5]