

A particle of mass m kg falls vertically under gravity, from rest. At time t s, P has fallen x m and has velocity v m s⁻¹. The only forces acting on P are its weight and a resistance of magnitude $kmgv$ N, where k is a constant.

(a) Find an expression for v in terms of t , g and k . [5]

(b) Given that $k = 0.05$, find, in metres, how far P has fallen when its speed is 12 m s⁻¹. [5]