A small object is projected horizontally with speed V m s^{-1} from a point O above horizontal ground. At time t s after projection, the horizontal and vertically upwards displacements of the object from O are x m and y m respectively.

(i) Express x and y in terms of t and hence show that the equation of the path of the object is $y = -\dfrac{5x^2}{V^2}$. [3]

The object passes through points with coordinates $(a, -a)$ and $(a^2, -16a)$, where a is a positive constant.

(ii) Find the value of a. [3]

(iii) Given that the object strikes the ground at the point where $x = 5a$, find the height of O above the ground . [2]