A small object is projected from a point O with speed V m s^{-1} at an angle of 45° above the horizontal. 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 find the equation of the path. [4]

The object passes through the point with coordinates (24, 18).

(ii) Find V. [2]

(iii) The object passes through two points which are 22.5 m above the level of O. Find the values of x for these points. [3]