

10.

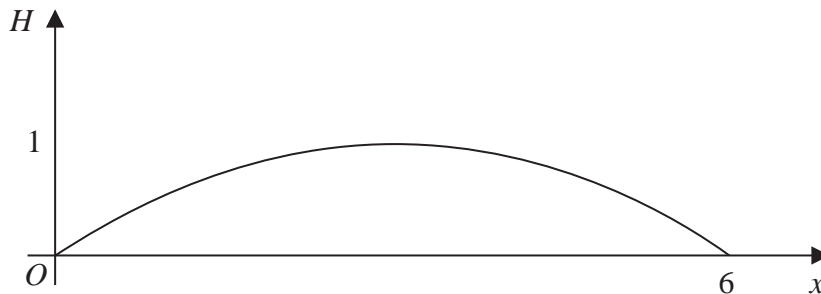


Figure 3

Figure 3 is a graph showing the trajectory of a snowboarder during a jump.

The vertical height, H metres, of the snowboarder above the ground has been plotted against the horizontal distance travelled, x metres, measured from where the snowboarder took off.

The snowboarder is modelled as a particle travelling in a vertical plane above horizontal ground.

The snowboarder

- reaches a maximum height of one metre above the ground
- lands on the ground at a point 6 metres from where the snowboarder took off

Given that H is modelled as a **quadratic** function in x

(a) find H in terms of x

(3)

The snowboarder passes over two vertical poles of height 0.5 metres. The poles are in the same plane as the snowboarder's motion.

(b) Use the model to find the greatest distance between the two poles.

(4)

(c) Give one limitation of the model.

(1)