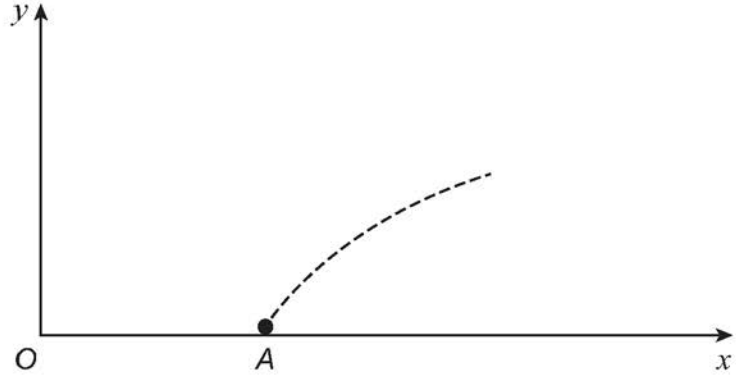
11 A fire crew is tackling a grass fire on horizontal ground.

The crew directs a single jet of water which flows continuously from point A.



The path of the jet can be modelled by the equation

$$y = -0.0125x^2 + 0.5x - 2.55$$

where x metres is the horizontal distance of the jet from the fire truck at O and y metres is the height of the jet above the ground.

The coordinates of point A are $(a, 0)$

11 (a) (i) Find the value of a.

[3 marks]

11 (a) (ii) Find the horizontal distance **from *A*** to the point where the jet hits the ground.

[1 mark]

11 (b) Calculate the maximum vertical height reached by the jet.

[4 marks]

11 (c) A vertical wall is located 11 metres horizontally from A in the direction of the jet. The height of the wall is 2.3 metres.

Using the model, determine whether the jet passes over the wall, stating any necessary modelling assumption.

[3 marks]