9.

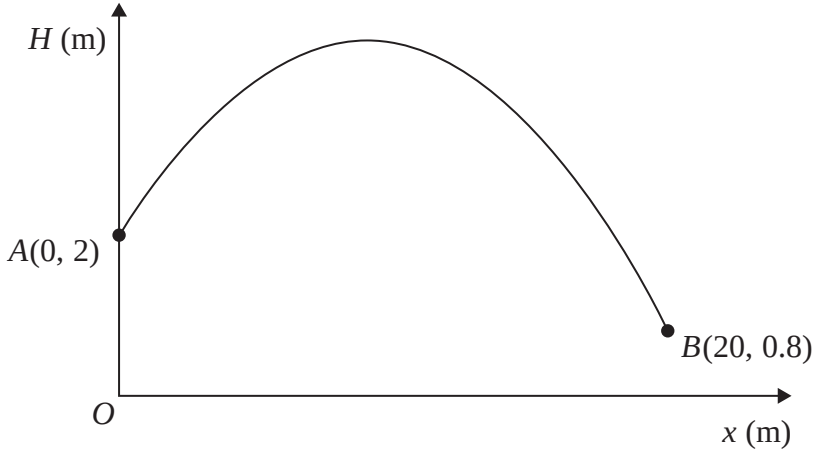

Figure 3

The graph in Figure 3 shows the path of a small ball.

The ball travels in a vertical plane above horizontal ground.

The ball is thrown from the point represented by *A* and caught at the point represented by *B*.

The height, *H* metres, of the ball above the ground has been plotted against the horizontal distance, *x* metres, measured from the point where the ball was thrown.

With respect to a fixed origin *O*, the point *A* has coordinates (0, 2) and the point *B* has coordinates (20, 0.8), as shown in Figure 3.

The ball reaches its maximum height when $x = 9$

A quadratic function, linking *H* with *x*, is used to model the path of the ball.

(a) Find *H* in terms of *x*.

(4)

(b) Give one limitation of the model.

(1)

Chandra is standing directly under the path of the ball at a point 16 m horizontally from *O*.

Chandra can catch the ball if the ball is less than 2.5 m above the ground.

(c) Use the model to determine if Chandra can catch the ball.

(2)