Modelling

Example

A spear is thrown over level ground from the top of a tower.

The height, in metres, of the spear above the ground after seconds is modelled by the function:

1. Interpret the meaning of the constant term 12.25 in the model.
2. After how many seconds does the spear hit the ground?
3. Write in the form , where and are constants to be found.
4. Using your answer to part c or otherwise, find the maximum height of the spear above the ground, and the time at which this maximum height is reached?

Test Your Understanding

A rectangular car park has a perimeter of 184 metres, and the diagonal of the car park measures 68 metres.

(i) By labelling the length of the car park as x metres, formulate an equation and check that x = 32 satisfies the equation. Hence find the dimensions of the car park.

(ii) Sketch the graph of the quadratic expression in part (i), and interpret each intersection with the x-axis in terms of the car park.

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