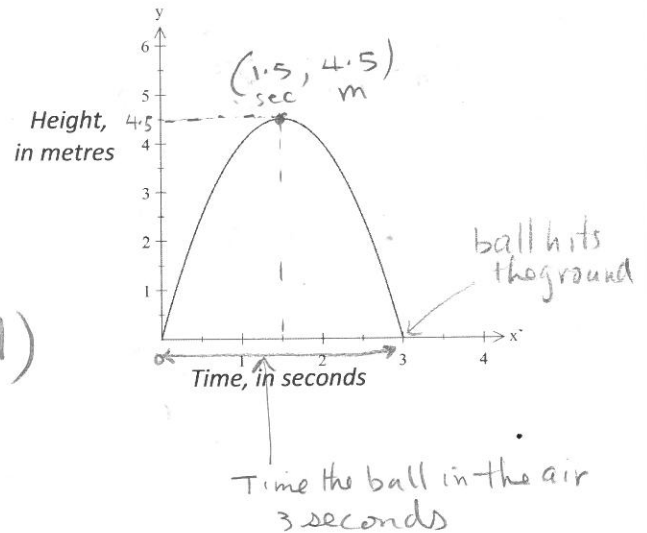


Lesson 5: Applications of Quadratic Functions

Example 1 Quadratic Application with Graph Given

A ball is kicked into the air. The graph below shows the height of the ball versus time.

- a) How long (how many seconds) is the ball in the air?
3 seconds
- b) What is the maximum height attained?
4.5 metres
- c) How long does it take the ball to reach its maximum height?
1.5 seconds
- d) What is the minimum height of the ball?
0 meters (ground level)

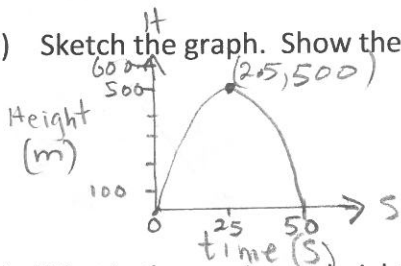


Example 2 Quadratic Application with Equation Given

You are playing golf on the Moon. You hit a ball with your golf club. The height of the ball, H , in metres, with respect to time, t , in seconds, can be modelled by the equation

$$H = -0.8t^2 + 40t$$

- a) Sketch the graph. Show the vertex and intercepts.



window
 $x_{\min} = 0$
 $x_{\max} = 60$
 $y_{\min} = 0$
 $y_{\max} = 600$

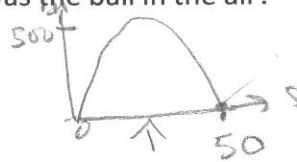
- b) What is the maximum height of the ball?

Find the vertex. The y -value of the vertex is the maximum height. The x value is the time it takes for the ball to reach the max. height.

2nd Trace Max ENTER
 $x = 2.5, y = 500 \Rightarrow 500 \text{ m}$

- c) How long (for how many seconds) was the ball in the air?

50 seconds



time the ball in the air