

Classroom to Campus: Math and Stats Challenge

Grade 11 – MBF3C

Topic A: Mathematical Models

Projectile Motion: Analyzing the Trajectory of an Object Fired Upward

On Planet Z , an object is fired upward from the ground with an initial velocity of 60 m/s . The height, h , in metres, of the object at time t , in seconds, is given by the equation:

$$h(t) = 60t - 20t^2$$

where t is the time in seconds since the object was fired.

- After how much time (in seconds) does the object reach a height of 30 metres? (Round your final answer to two decimal places. Include units.)
- Determine the maximum height the object reaches. (Round your final answer to two decimal places. Include units.)
- After how much time (in seconds) does the object reach its maximum height? (Round your final answer to two decimal places. Include units.)
- Determine after how many seconds the object will hit the ground. (Round your final answer to two decimal places. Include units.)
- Determine the time interval that the height of the object is greater than 20 metres. (Round your final answers to two decimal places. Include units.)

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