Class 11: Some Physics

Calculus II

College of the Atlantic. January 29, 2025

1. A rock is launched straight up from ground level at an initial velocity of 50 . While in the air, it experiences a constant acceleration of -9.8 m/s^2.
   (a) Sketch $v(t)$, the rock's velocity as a function of time t.
   (b) Write $v(t)$ as a definite integral.
   (c) Determine a formula for $v(t)$.
   (d) At what time t does the rock reach its greatest height?
   (e) Write $z(t)$ as a definite integral.
   (f) Determine a formula for $z(t)$.

2. What is the weight (force due to gravity) of a 50 kg unicorn?

3. A 2 kg Nalgene bottle experiences a constant net force of 40 N. What is its acceleration.

4. A 0.1 kg rocket experiences a constant thrust of 7.5 N directly upwards, for 0.6 s. During this time interval, how far does the travel. The rocket is initially at an altitude of 10 meters traveling at 30 m/s.