QUIZ 11   **Time: 10min**

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1. A ball is thrown upward from the surface of a planet where the acceleration of gravity is k (a negative constant) with an initial velocity of v_0.

(i) Show that the height of the object at time t is given by $y(t) = \frac{1}{2}kt^2 + v_0 t$. (Hint: solve the differential equation $\frac{d^2y}{dt^2} = k$ by twice taking the antiderivatives of both sides.)

(ii) What is the maximum height achieved by the object (Hint: find the maximum value of $y(t)$).

Parts (i) and (ii) are worth 4 points each. Part (iii) is worth 2 points.