PHY151H1F – Practice Problem Set 4

1. A rocket ignited on the ground travels vertically upward with an acceleration of magnitude 4g. A spent rocket stage detaches from the payload after the rocket has accelerated for 5.0 s. With what speed does the spent stage hit the ground? ••

2. A particle is accelerated such that its position as a function of time is given by $\vec{x} = bt^3\hat{\imath}$, with $b = 1.0 \text{ m/s}^3$. What is the particle's acceleration as a function of time? •

3. The acceleration of a particular car during braking has magnitude bt, where t is the time in seconds from the instant the car begins braking, and $b = 2.0 \text{ m/s}^3$. If the car has an initial speed of 50 m/s, how far does it travel before it stops? ••