Name: _____
ID #: _____

Physics 221 - Fall 2019
★ Homework ★
Chapter 10 - 11

1) **10.8**

2) **10.10**

3) **10.11**

4) **10.12**

5) **10.17**

6) [10.14 modified] **a) Solve equation 10.19 for v as a function of mass, assuming $v = 0$, $x = 0$ and $m = m_o$ at t=0. b) Derive the mass of the rocket as a function of time. c) Use b) to convert a) into $v(t)$.**

7) **a) What is the percentage difference between L and its maximum possible projection along the z-axis, $|L_z|_{max}$, if ℓ=3? b) What is the angle, θ, between L and the z-axis in this case?**

8) Let $\mathbf{J} = \mathbf{L_1} + \mathbf{L_2}$.
a) Write down all possible values of $|J|$ and $|J_z|$, if $|L_1| = \sqrt{\ell_1(\ell_1+1)}\hbar = \sqrt{6}\hbar$ and $|L_2| = \sqrt{\ell_2(\ell_2+1)}\hbar = \sqrt{2}\hbar$.
b) What is the total number of states listed in a)?