

Physics 487 – Homework #3

due Friday 1 pm as usual

*All solutions must clearly show the steps and/or reasoning you used to arrive at your result. You will lose points for poorly written solutions or incorrect reasoning. Answers given without explanation will not be graded: our master rule for homework and exams is **NO WORK = NO POINTS**. However you may always use any relation on the 3D-calculus and 1D-math formula sheets without proof; both are posted in the same place you found this homework. Finally please write your **NAME** and **DISCUSSION SECTION** on your solutions. ☺*

You may use anything from the **486 final formula sheets** without derivation ... but do try to see how far you can get on your own on your Desert Island. ☺
You may also use wolframalpha.com or similar tool to evaluate your integrals **after you set the up** in a form that can be **directly entered** into such tools.

Problem 1 : Clebsch-Gordan

This is Discussion 3 Question 2

Add a spin-3/2 particle and a spin-1 particle to build the state $|J, M\rangle = \left| \frac{3}{2}, +\frac{1}{2} \right\rangle_{J,M}$ from $|m_1, m_2\rangle$ states.

Calculate the result using the A, B, C method you used in Discussion 3 Question 1, doing only the steps you need (!) to reach the state you want. See the Discussion 3 Question 1 solution if you need guidance, and, of course, check your answer against a Clebsch-Gordan (CG) table, e.g. the one provided with Discussion 3.

That is all. Only one problem this time, to keep the due-date schedule the same.