

Phys 402
Spring 2019
Homework 5
Due Friday, March 15, 2019 @ 9 AM

1. Griffiths, 2nd Edition, Problem 5.1 or Griffiths, 3rd Edition, Problem 5.1
[The quantum 2-body problem - (a) **consider the gradient operator change of variables component-wise: $(\nabla_1)_{x_1} = \frac{\partial}{\partial x_1} = \frac{\partial X}{\partial x_1} \frac{\partial}{\partial X} + \frac{\partial x}{\partial x_1} \frac{\partial}{\partial x} = \frac{\mu}{m_2} (\nabla_R)_x + (\nabla_r)_x$, etc.]**
2. Griffiths, 2nd Edition, Problem 5.4 or Griffiths, 3rd Edition, Problem 5.4
[Normalization of 2-identical-particle wavefunctions]
3. Griffiths, 2nd Edition, Problem 5.5 or Griffiths, 3rd Edition, Problem 5.5
[2-identical-particles in an infinite square well - energies and wavefunctions]
4. Griffiths, 2nd Edition, Problem 5.7 or Griffiths, 3rd Edition, Problem 5.8
[The Slater determinant for constructing many-identical Fermion wavefunctions]

Extra Credit:

- Griffiths, 2nd Edition, Problem 5.35 or Griffiths, 3rd Edition, Problem 5.35
[Degeneracy pressure in white dwarfs]