

Physics 7502: Homework Set No. 10

Due date: Tuesday, April 5, 2016, 5:00pm
in PRB M2039 (Bowen Shi's office)

Total point value of set: 40 points

Problem 1 (10 pts.):

Show by explicit differentiation that $G(\mathbf{r}, \mathbf{r}') = e^{ik|\mathbf{r}-\mathbf{r}'|}/(4\pi|\mathbf{r}-\mathbf{r}'|)$ is the Green function of the Helmholtz equation, i.e. it solves the Helmholtz equation for a point source.

Hint: Think carefully about how to separate the δ -function piece from the regular terms.

Problem 2 (10 pts.): Exercise 19.3.1 (Shankar, p. 533)

Problem 3 (10 pts.): Exercise 19.3.2 (Shankar, p. 533)

Problem 4 (10 pts.): Exercise 19.3.3 (Shankar, p. 533)