

PHYS5701 Quantum Mechanics I Fall 2020 HW #1
Due at 5pm to the Grader on Thursday 3 Sep 2020

(1) MQM3e Problem 1.1

(2) Let \mathbf{E}_+ and \mathbf{E}_- stand for right and left circularly polarized electric field components of a plane wave moving in the $\hat{\mathbf{z}}$ -direction. Following (1.12) in MQM3e, write these *as complex quantities* in terms of complex circular polarization unit vectors $\hat{\mathbf{e}}_{\pm}$. Then show that the real parts of \mathbf{E}_+ and \mathbf{E}_- rotate in opposite directions. Also show that \mathbf{E}_+ and \mathbf{E}_- are orthogonal if one defines the inner product appropriately.

(3) MQM3e Problem 1.3

(4) MQM3e Problem 1.4

(5) MQM3e Problem 1.7