For young's double-slit experiments with orthogonally polarized lights E_1 and E_2,

1. Calculate the output intensity I(y) at an arbitrary point P(y) on the screen as a function of y. Both electric fields E_1 and E_2 have the same phase at the double slits. $L \gg a$. Hint: use the basis notation for inner product. $\hat{\imath} \cdot \hat{\jmath} = 0$.

2. At y=0, calculate intensity I(0) as a function of rotation φ of the E_2 field's polarization for the fixed E_1 polarization.