1. Develop a general summary of the plate equation for concrete pavement analysis. Show your development in at least seven distinct steps showing diagrams if necessary. State explicitly where either plane stress or plane strain conditions are applied. Explain how slab theory accounts for shear stresses and the significance of this with respect to shear deformation. (Answer question in 1 page - only)

2. If \( V_x = \frac{\partial M_x}{\partial x} + \frac{\partial M_{xy}}{\partial y} \); show \( V_x \) in terms of \( w \).

3. Consider a plate bent by moment \( M_x \) (i.e. \( M_y = 0 \))

Show mathematically that the plate curvature in the y-direction is opposite that in the x-direction and develop an expression for \( M_x \). This type of bending is called anticlastic bending. (As compared to beam theory which would predict a cylindrically bent surface). Why is this bending more pronounced for incompressible materials?