## Problem 130B

Consider small amplitude, travelling water waves of wavelength, $\lambda$ (wavenumber, $k = 2\pi/\lambda$), on an infinitely deep ocean of infinite horizontal extent. If the surface tension of the free surface is to be included in the analysis, find the propagation speed of the waves, $c$, in terms of the wavenumber, $k$, the surface tension, $S$, the fluid density, $\rho$, and the acceleration due to gravity, $g$. Assume planar, incompressible, inviscid and irrotational flow.