Problem 1

Drazin & Reid 1.11

Problem 2

Drazin & Reid 1.7

Hint: There are *three* domains in this problem: $z > L$, $|z| < L$ and $z < -L$. The first condition that $(s + ikU)^{-1} \partial\phi'/\partial z$ be continuous comes from the kinematic interfacial condition; the second condition that $(s + ikU)\phi'$ is continuous comes from continuity of pressure for the homogeneous fluid.