Problem 120I
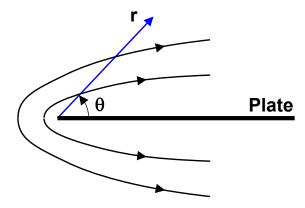
Find a velocity potential for the irrotational, planar flow of an incompressible, inviscid fluid around the end of an infinitely thin, flat plate :

Use polar coordinates r and θ as shown. The desired solution yields velocities which are finite as r tends to infinity but may be infinite as r tends to zero.