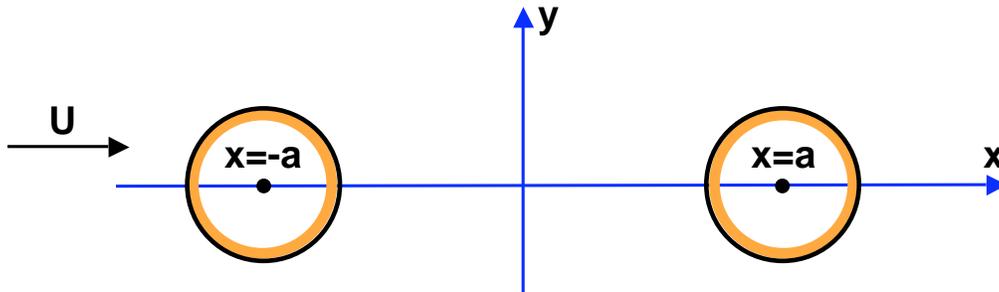


Problem 120J

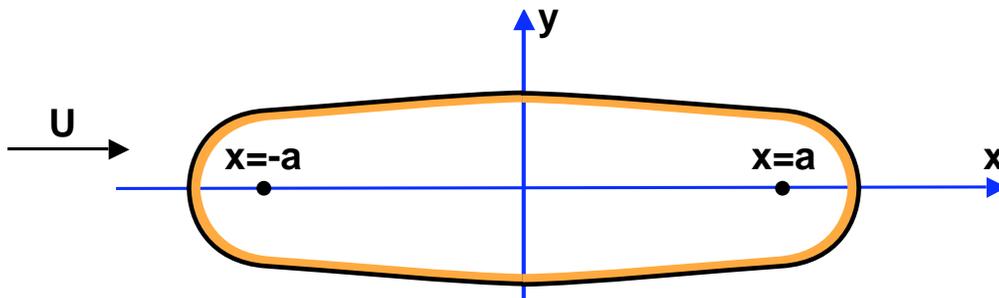
This question is concerned with planar, incompressible, inviscid potential flow.

[A] Find the expression for the streamfunction, ψ , for a planar doublet at the origin of the x, y coordinate system whose strength is given by B and whose velocity potential is $\phi = Bx/(x^2 + y^2)$. Give your answer in terms of B, x and y .

[B] The flow of a uniform stream (velocity, U) in the x direction around an elongated body is to be constructed by placing a planar doublet at $x = a, y = 0$ and another one at $x = -a, y = 0$. They both have the same strength, B , and orientation. For small values of B the result is the flow around two bodies:



For large values of B the result is the flow around a single body:



Determine the condition on B which results in the single body flow.