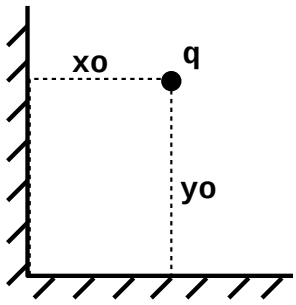
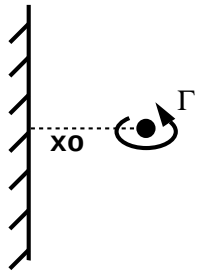
POTENTIAL FLOWS

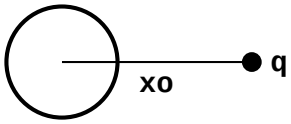
8.1) Find, by the method of images, the 2D potential flow of a point charge of strength q placed at a distance (x_0, y_0) from the intersection of two perpendicular planes.



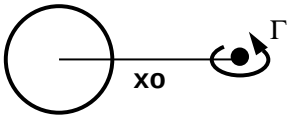
8.2) Find, by the method of images, the 2D potential flow of a point vortex of strength Γ placed at a distance x_0 from a vertical plane.



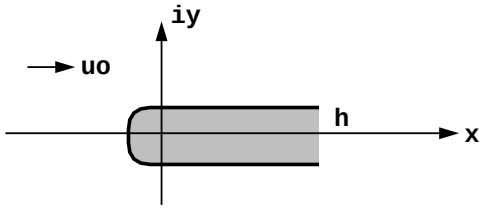
8.3) Consider the flow of a point charge of strength q placed at a distance x_0 from a circular cilinder of radius a.
a) Find the complex potential describing the flow (use the circle theorem). Identify each term in the potential with elemental flow fields.
b) Calculate the force on the cylinder (use Blasius' theorem).



8.4) Consider the flow of a point vortex of strength Γ placed at a distance x_0 from a circular cilinder of radius a.
a) Find the complex potential describing the flow (use the circle theorem). Identify each term in the potential with elemental flow fields.
b) Calculate the force on the cylinder (use Blasius' theorem).



8.5) Calculate the force exterted by a uniform flow of speed u_0 past a half-body of width h, using Blasius' theorem.



8.6) Calculate the force exterted by a uniform flow of speed u_0 past a Rankine body generated by two sources of strength q located at $x = -a$ and $x = a$. Use Blasius' theorem.