

CE371 HOMEWORK -3- (Due on 27.11.2019)

Q1) The x - and y -components of a velocity field are given by and where $u=(V_0/L)x$ and $v=-(V_0/L)y$, where $V_0=0.5$ m/s and $L=2$ m are constants.

- a) What is the dimension of the flow?
- b) Is flow compressible?
- c) Is flow rotational?
- d) Determine the acceleration field.
- d) Plot the streamlines for this flow.

Q2) 4.11 A flow velocity field is given by;

$$\mathbf{V}=(c(x^2-y^2))\mathbf{i}+(-2cxy)\mathbf{j}$$

where c is a constant. Show that the streamlines for this velocity field are given by the equation $x^2y-y^3/3=\text{constant}$. At which point(points) is the flow parallel to the y axis? At which point(points) is the fluid stationary?