

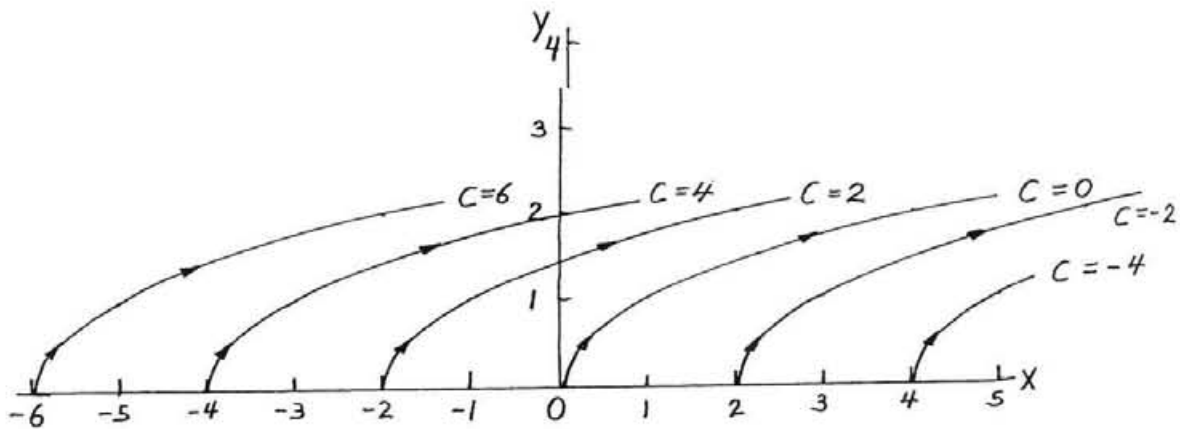
4.10 The x and y components of velocity for a two-dimensional flow are $u = 6y$ ft/s and $v = 3$ ft/s, where y is in feet. Determine the equation for the streamlines and sketch representative streamlines in the upper half plane.

$u = 6y$, $v = 3$ where streamlines are obtained from

$\frac{dy}{dx} = \frac{v}{u} = \frac{3}{6y}$ or $2y dy = dx$ which can be integrated to give

$y^2 = x + C$, where C is a constant.

Representative streamlines corresponding to different values of C are shown below.



Note that for $y > 0$, $u > 0$ (i.e., the flow is from left to right)