Examples of Flows and their Associated Complex Potentials, following White's *Fluid Mechanics* (5th edition)

$z = x + iy$ $w = f + iy$ $\mathrm{d}w/\mathrm{d}z = V_x - iV_y$

Description	$\vec{V}$	w	y	f
Uniform flow See page 265, 545.	$V_x = U$, $V_y = V$	$w = (U - iV)z$	$Uy - Vx$	$Ux + Vy$
Simple source of strength m; m^2/s), located at z_0. $m = Q/(2pb)$ if $m < 0$, it is a "sink". See page 265, 545.	$V_r = m/r$ $V_q = 0$ origin is "singular"	$w = m\ln(z - z_0)$	mq	$m\ln(r)$
"Irrotational" vortex (CCW), with center at z_0. This vortex is fastest at its center. Vorticity at the origin $\rightarrow\infty$, but is zero everywhere else. See page 265, 546.	$V_r = 0$ $V_q = k/r$	$w =$ $-ik\ln(z - z_0)$ Use negative values of k for CW rotation; $G = 2pk$	$-k\ln(r)$	kq
Stagnation Point (corner flow), $u>0$ along $y=0$, $x>0$. See page 546.	n corresponds to the angle b of the corner: $b = 180°/n = p/n$	$w = Az^n$	$Ar^n\sin(nq)$	$Ar^n\cos(nq)$