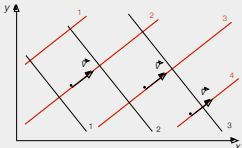
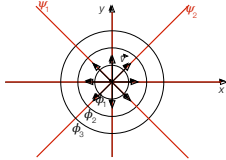
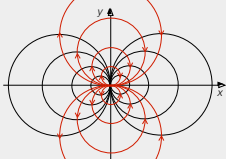
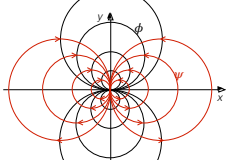
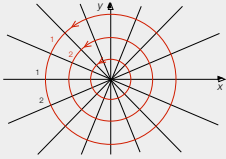
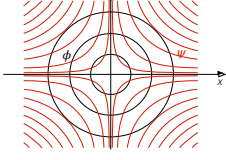


# Formelsammlung zur Potentialtheorie

Elementarströmung	Strom- und Potentiallinien	Potentialfunktion $\Phi(x,y)$ $\Phi(r,\varphi)$	Stromfunktion $\Psi(x,y)$ $\Psi(r,\varphi)$	$u(x,y)$ $u(r,\varphi)$	$v(x,y)$ $v(r,\varphi)$	$v_r(x,y)$ $v_r(r,\varphi)$	$v_\varphi(x,y)$ $v_\varphi(r,\varphi)$
Translationsströmung		$u_1 x + v_1 y$ $u_1 r \cos \varphi + v_1 r \sin \varphi$	$-v_1 x + u_1 y$ $-v_1 r \cos \varphi + u_1 r \sin \varphi$	$u_1$ $u_1$	$v_1$ $v_1$	$u_1 \frac{x}{\sqrt{x^2+y^2}} + v_1 \frac{y}{\sqrt{x^2+y^2}}$ $u_1 \cos \varphi + v_1 \sin \varphi$	$u_1 \frac{y}{\sqrt{x^2+y^2}} - v_1 \frac{x}{\sqrt{x^2+y^2}}$ $-u_1 \sin \varphi + v_1 \cos \varphi$
Quellen- und Senkenströmung		$\frac{Q}{2\pi} \ln \sqrt{x^2+y^2}$ $\frac{Q}{2\pi} \ln r$	$\frac{Q}{2\pi} \arctan\left(\frac{y}{x}\right)$ $\frac{Q}{2\pi} \varphi$	$\frac{Q}{2\pi} \frac{x}{x^2+y^2}$ $\frac{Q}{2\pi} \frac{\cos \varphi}{r}$	$\frac{Q}{2\pi} \frac{y}{x^2+y^2}$ $\frac{Q}{2\pi} \frac{\sin \varphi}{r}$	$\frac{Q}{2\pi} \frac{1}{\sqrt{x^2+y^2}}$ $\frac{Q}{2\pi r}$	0 0
Dipolströmung (x-Achse ist Dipolachse)		$\frac{M}{2\pi} \frac{x}{x^2+y^2}$ $\frac{M}{2\pi} \frac{\cos \varphi}{r}$	$-\frac{M}{2\pi} \frac{y}{x^2+y^2}$ $-\frac{M}{2\pi} \frac{\sin \varphi}{r}$	$-\frac{M}{2\pi} \frac{x^2-y^2}{(x^2+y^2)^2}$ $-\frac{M}{2\pi} \frac{\cos(2\varphi)}{r^2}$	$-\frac{M}{2\pi} \frac{2xy}{(x^2+y^2)^2}$ $-\frac{M}{2\pi} \frac{\sin(2\varphi)}{r^2}$	$-\frac{M}{2\pi} \frac{x}{(x^2+y^2)^{1.5}}$ $-\frac{M}{2\pi} \frac{\cos \varphi}{r^2}$	$-\frac{M}{2\pi} \frac{y}{(x^2+y^2)^{1.5}}$ $-\frac{M}{2\pi} \frac{\sin \varphi}{r^2}$
Dipolströmung (y-Achse ist Dipolachse)		$\frac{M}{2\pi} \frac{y}{x^2+y^2}$ $\frac{M}{2\pi} \frac{\sin \varphi}{r}$	$\frac{M}{2\pi} \frac{x}{x^2+y^2}$ $\frac{M}{2\pi} \frac{\cos \varphi}{r}$	$-\frac{M}{2\pi} \frac{2xy}{(x^2+y^2)^2}$ $-\frac{M}{2\pi} \frac{\sin(2\varphi)}{r^2}$	$\frac{M}{2\pi} \frac{x^2-y^2}{(x^2+y^2)^2}$ $\frac{M}{2\pi} \frac{\cos(2\varphi)}{r^2}$	$-\frac{M}{2\pi} \frac{y}{(x^2+y^2)^{1.5}}$ $-\frac{M}{2\pi} \frac{\sin \varphi}{r^2}$	$\frac{M}{2\pi} \frac{x}{(x^2+y^2)^{1.5}}$ $\frac{M}{2\pi} \frac{\cos \varphi}{r^2}$
Potentialwirbel		$-\frac{\Gamma}{2\pi} \arctan\left(\frac{y}{x}\right)$ $-\frac{\Gamma}{2\pi} \varphi$	$\frac{\Gamma}{2\pi} \ln \sqrt{x^2+y^2}$ $\frac{\Gamma}{2\pi} \ln r$	$\frac{\Gamma}{2\pi} \frac{y}{x^2+y^2}$ $\frac{\Gamma}{2\pi} \frac{\sin \varphi}{r}$	$-\frac{\Gamma}{2\pi} \frac{x}{x^2+y^2}$ $-\frac{\Gamma}{2\pi} \frac{\cos \varphi}{r}$	0 0	$-\frac{\Gamma}{2\pi} \frac{1}{\sqrt{x^2+y^2}}$ $-\frac{\Gamma}{2\pi r}$
Staupunktströmung		$\frac{a}{2}(x^2-y^2)$ $\frac{a}{2}r^2 \cos(2\varphi)$	$axy$ $\frac{a}{2}r^2 \sin(2\varphi)$	$ax$ $ar \cos \varphi$	$-ay$ $-ar \sin \varphi$	$a \frac{x^2-y^2}{\sqrt{x^2+y^2}}$ $ar \cos(2\varphi)$	$-a \frac{2xy}{\sqrt{x^2+y^2}}$ $-ar \sin(2\varphi)$