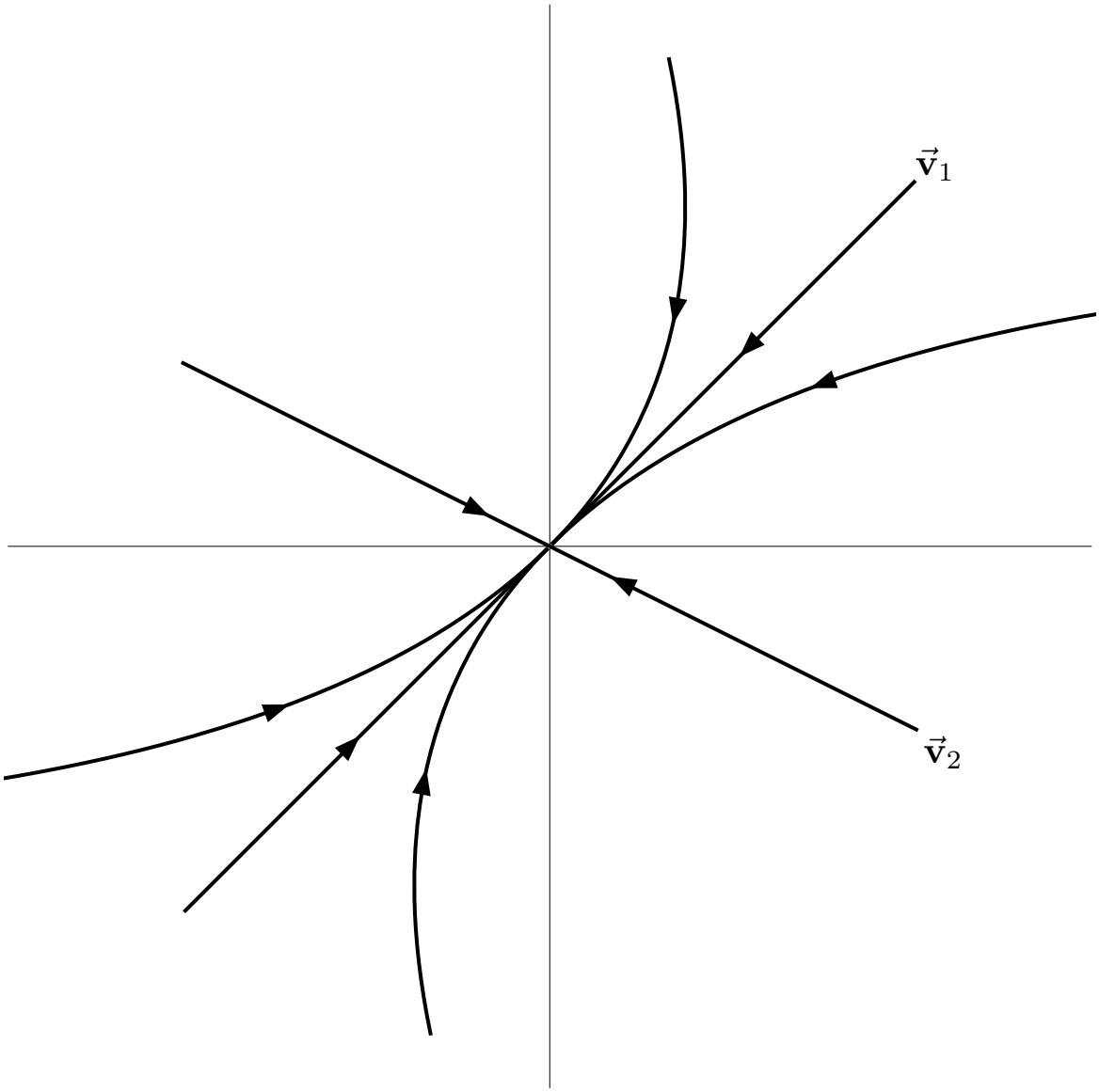
Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

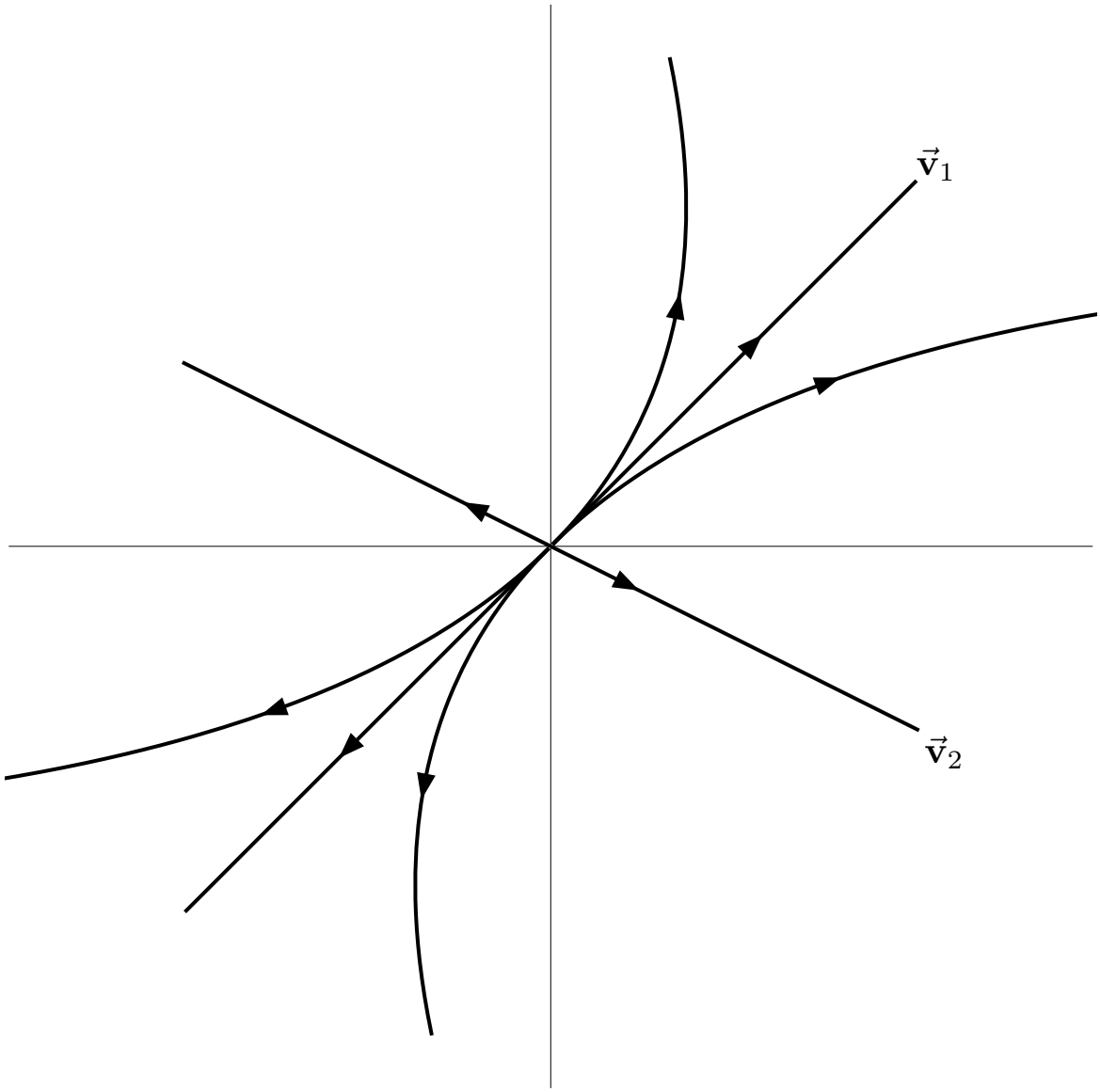


Asymptotically stable improper node

$$\vec{\mathbf{x}} = c_1\vec{\mathbf{v}}_1 e^{\lambda_1 t} + c_2\vec{\mathbf{v}}_2 e^{\lambda_2 t}$$

with $\lambda_1,\ \lambda_2 < 0$ and $|\lambda_1| < |\lambda_2|$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

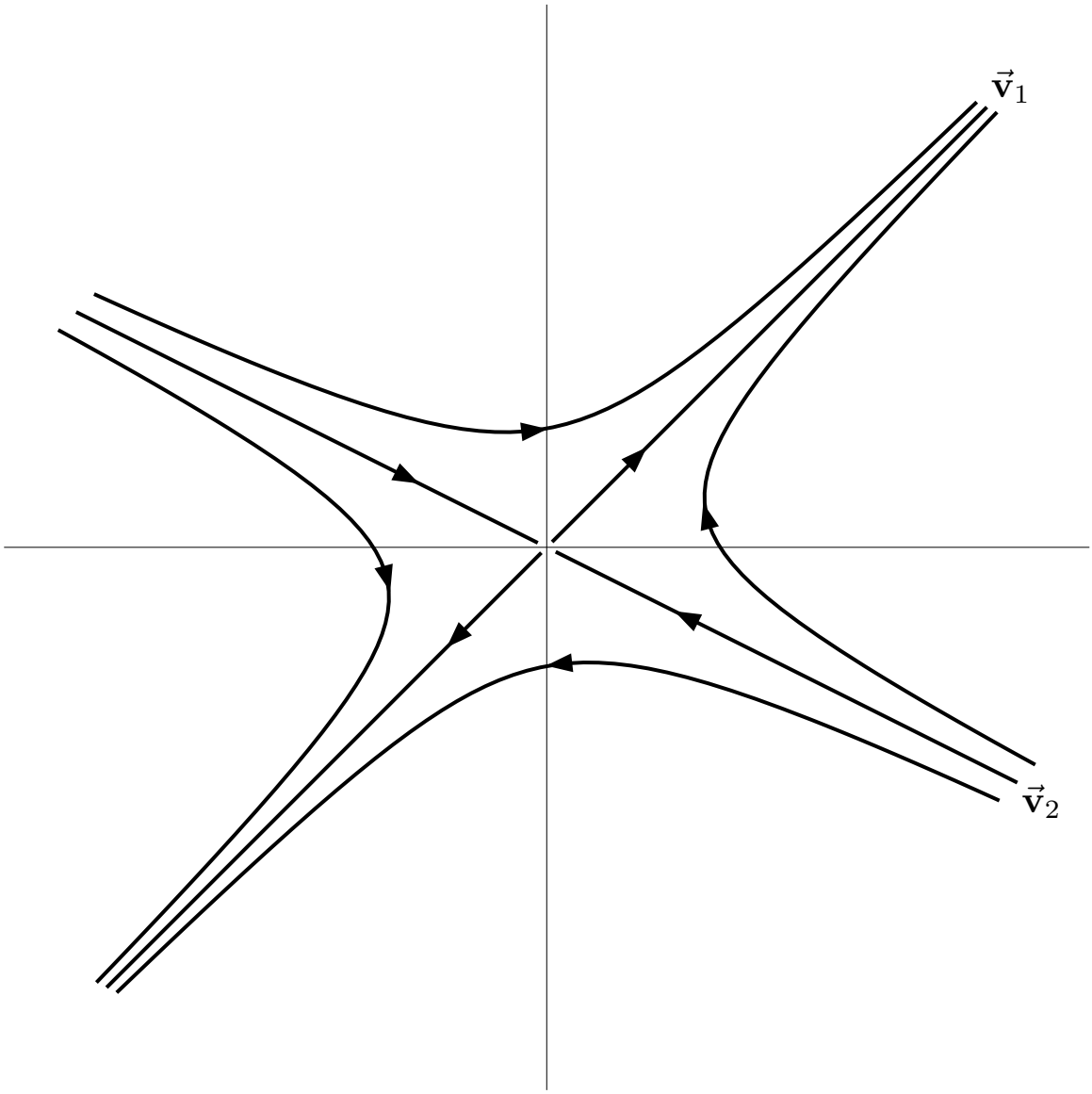


Unstable, improper node

$$\vec{\mathbf{x}} = c_1\vec{\mathbf{v}}_1 e^{\lambda_1 t} + c_2\vec{\mathbf{v}}_2 e^{\lambda_2 t}$$

with $\lambda_1,\ \lambda_2 > 0$ and $|\lambda_1| < |\lambda_2|$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

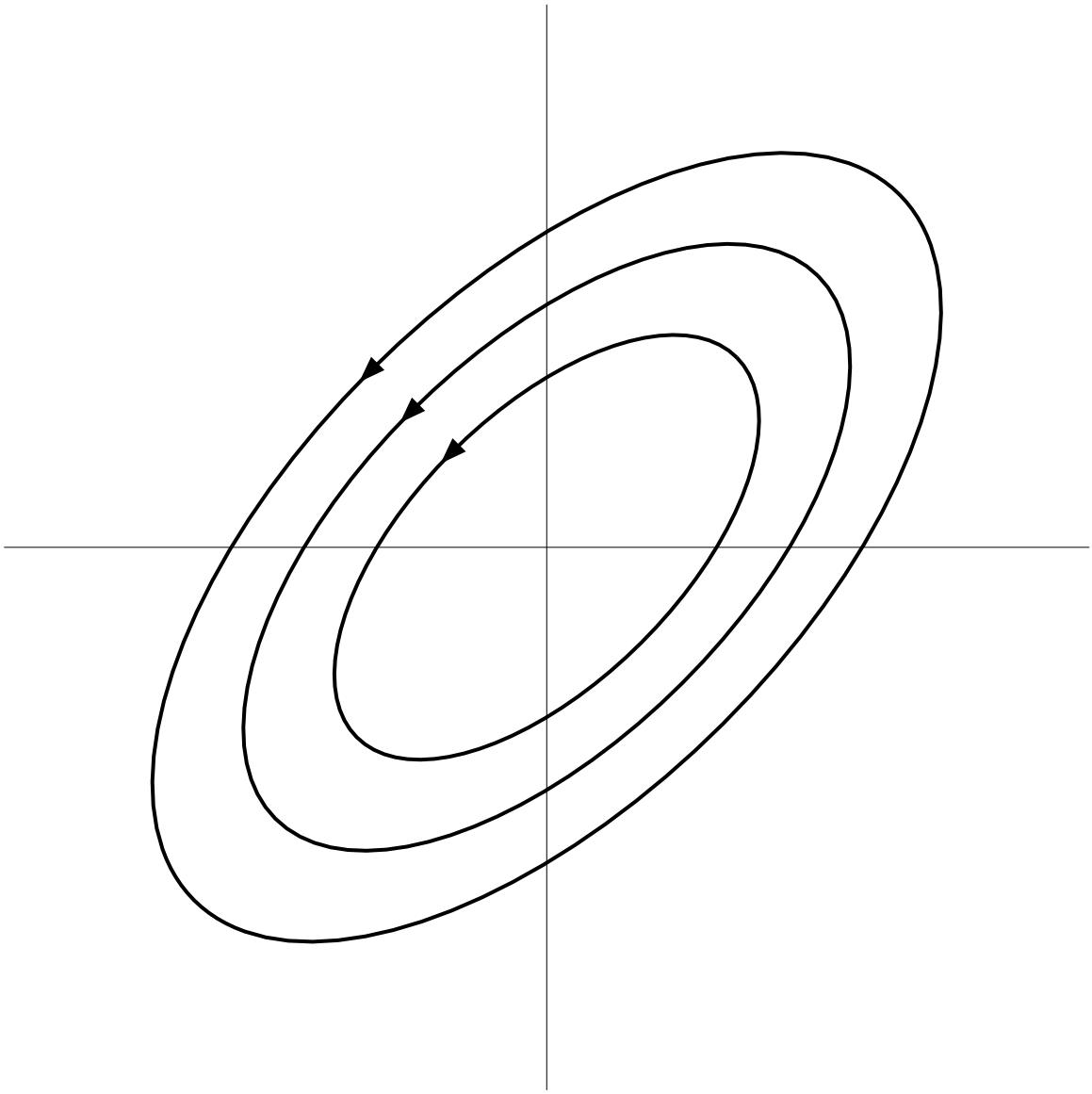


(Unstable) saddle point

$\vec{\mathbf{x}} = c_1\vec{\mathbf{v}}_1 e^{\lambda_1 t} + c_2\vec{\mathbf{v}}_2 e^{\lambda_2 t}$

with $\lambda_1 > 0$ and $\lambda_2 < 0$

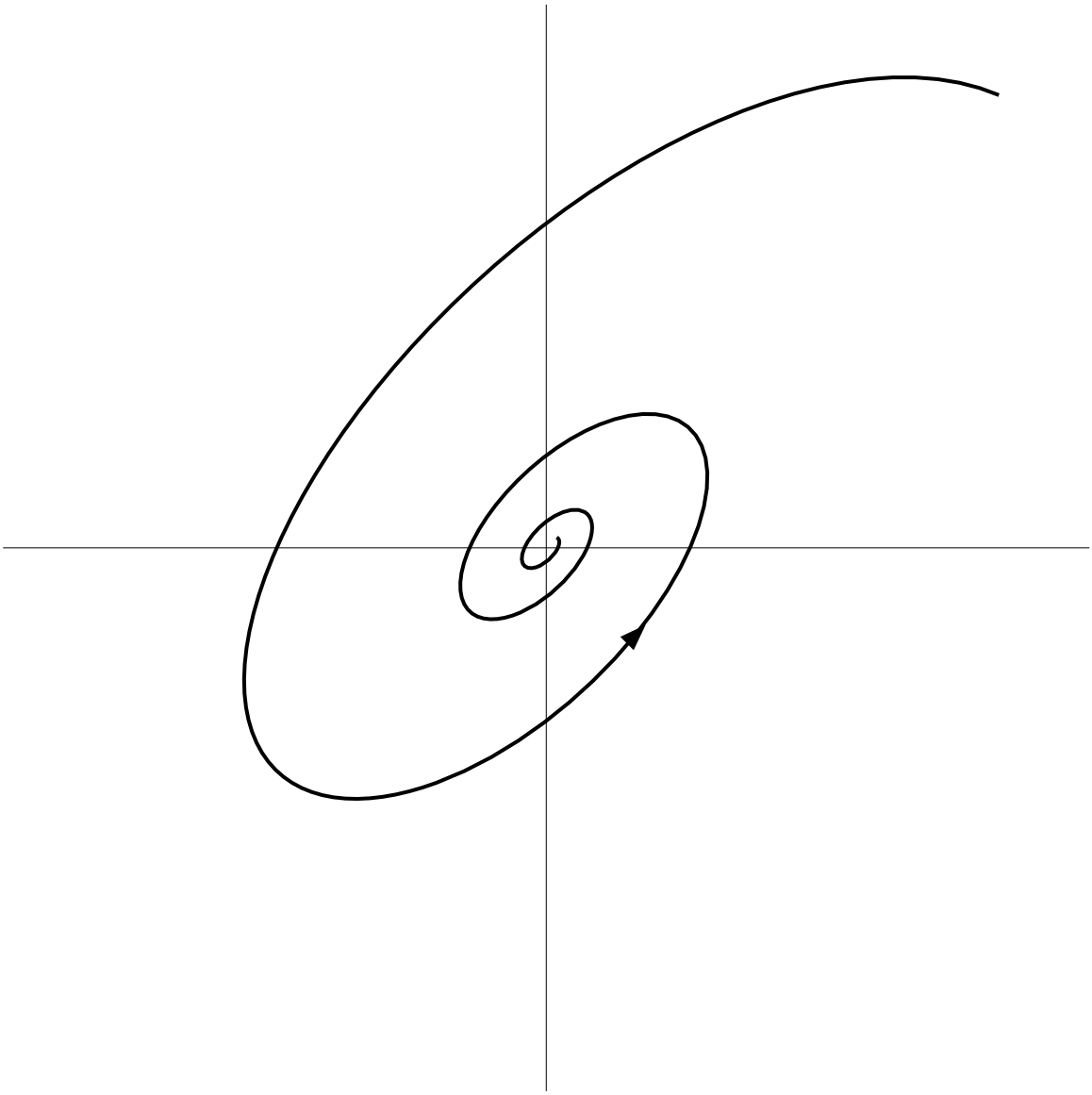
Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0



(Stable) centre

$$\vec{\mathbf{x}} = \vec{\mathbf{a}} \cos \mu t + \vec{\mathbf{b}} \sin \mu t$$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

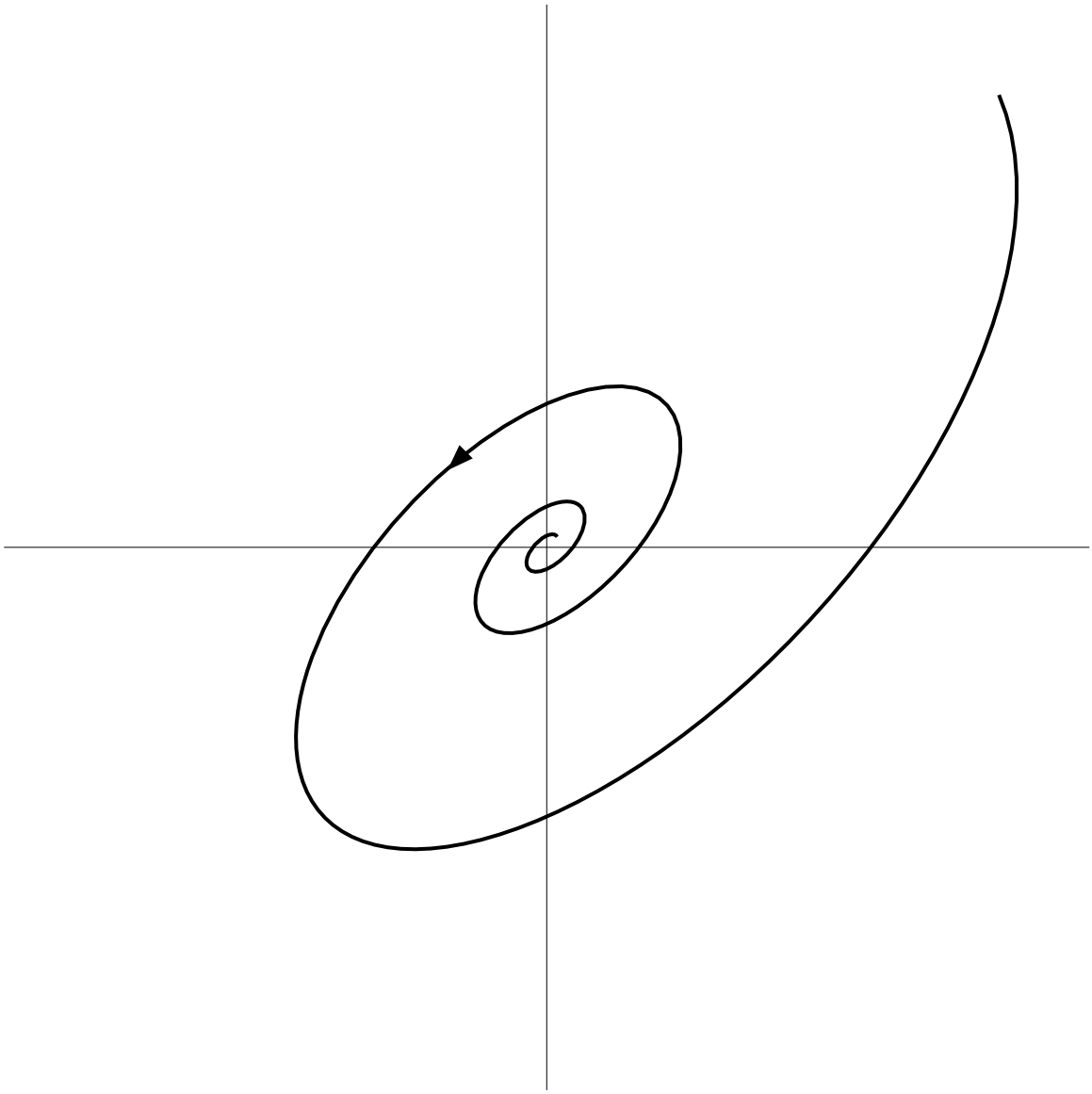


Asymptotically stable spiral point

$$\vec{\mathbf{x}} = e^{\lambda t}\left\{\vec{\mathbf{a}}\cos\mu t + \vec{\mathbf{b}}\sin\mu t\right\}$$

with $\lambda < 0$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

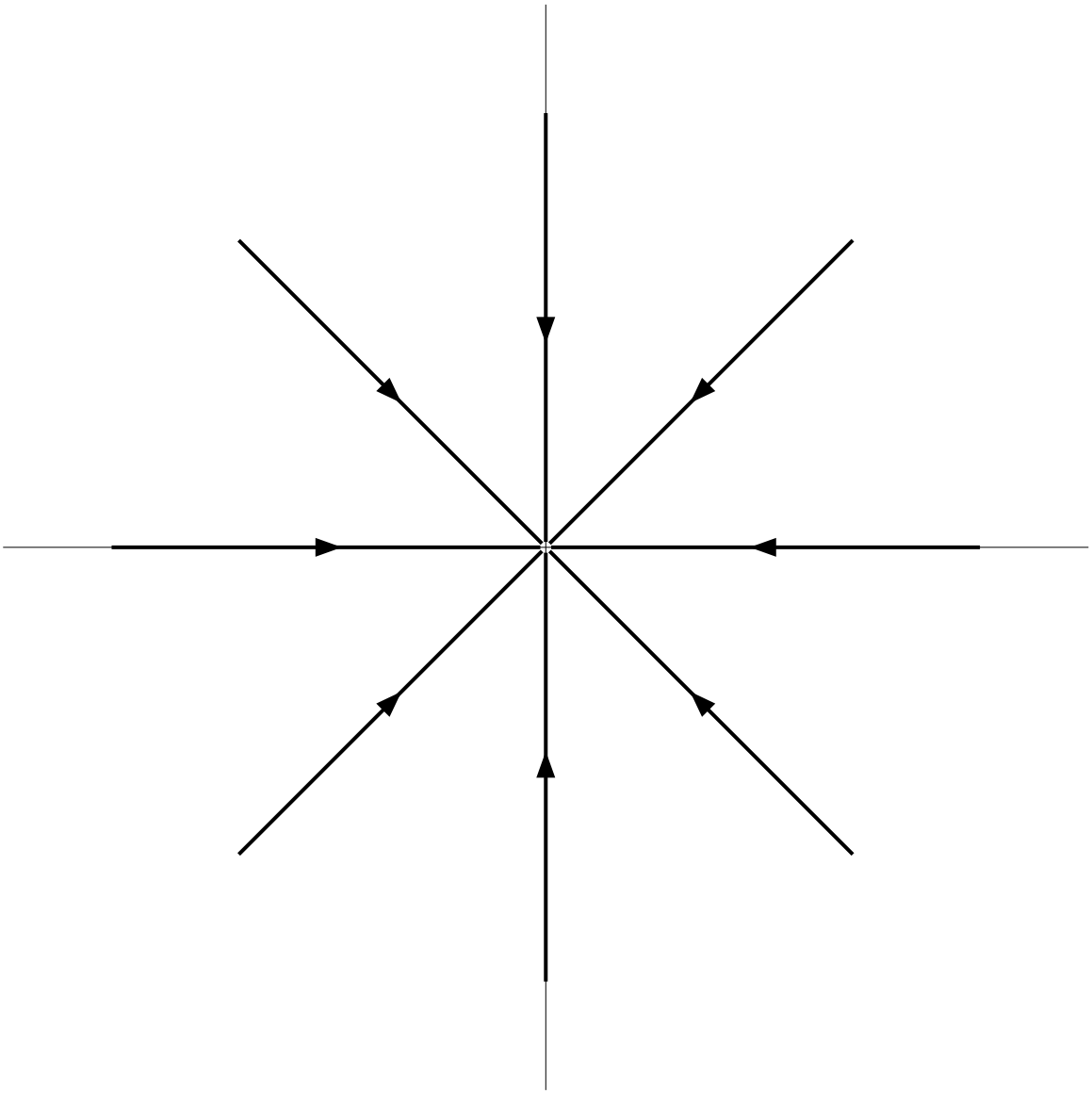


Unstable spiral point

$$\vec{\mathbf{x}} = e^{\lambda t}\left\{\vec{\mathbf{a}}\cos\mu t + \vec{\mathbf{b}}\sin\mu t\right\}$$

with $\lambda > 0$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

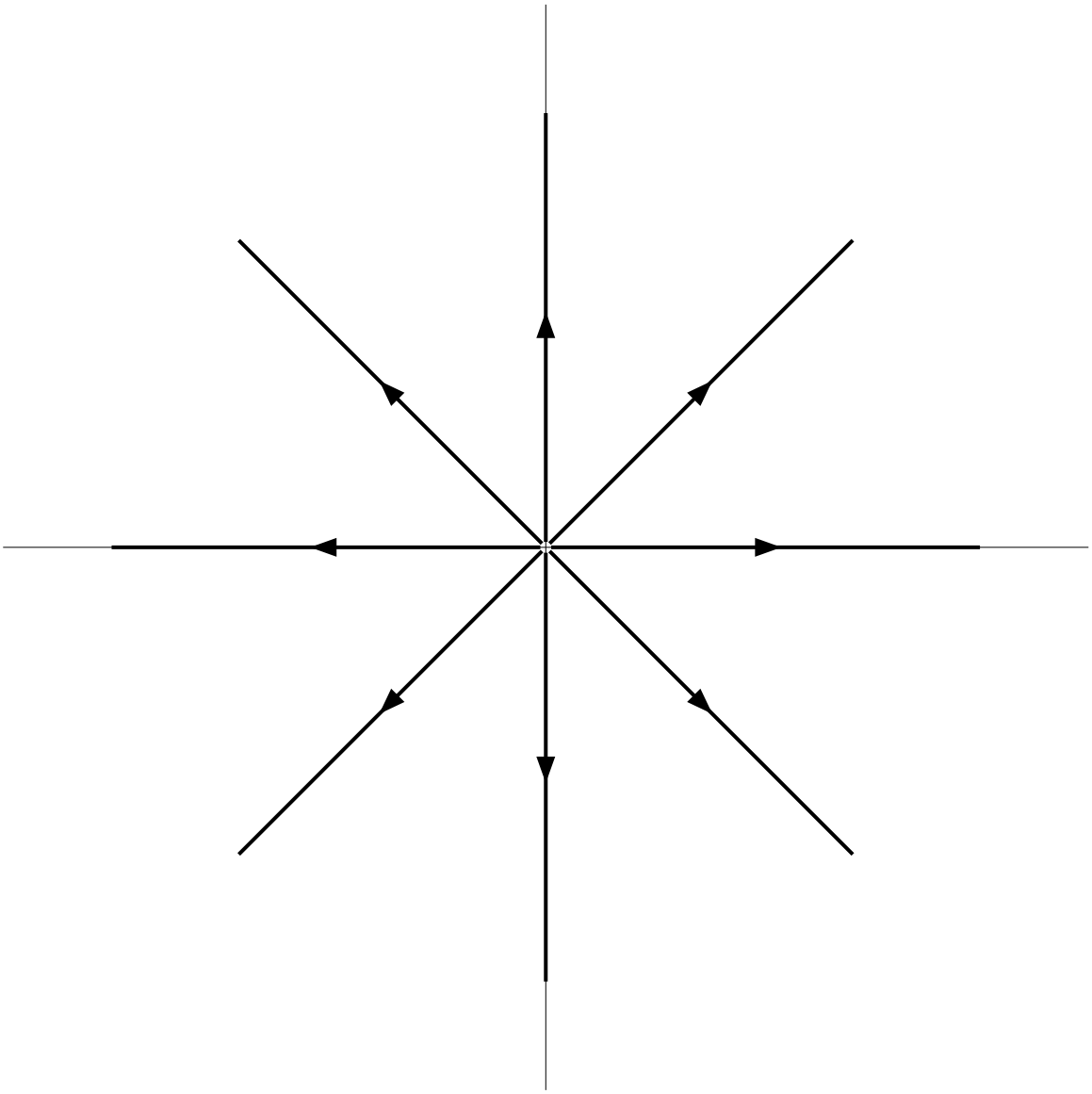


Asymptotically stable proper node

$$\vec{\mathbf{x}} = c_1\vec{\mathbf{v}}_1 e^{\lambda_1 t} + c_2\vec{\mathbf{v}}_2 e^{\lambda_2 t}$$

with $\lambda_1 = \lambda_2 < 0$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

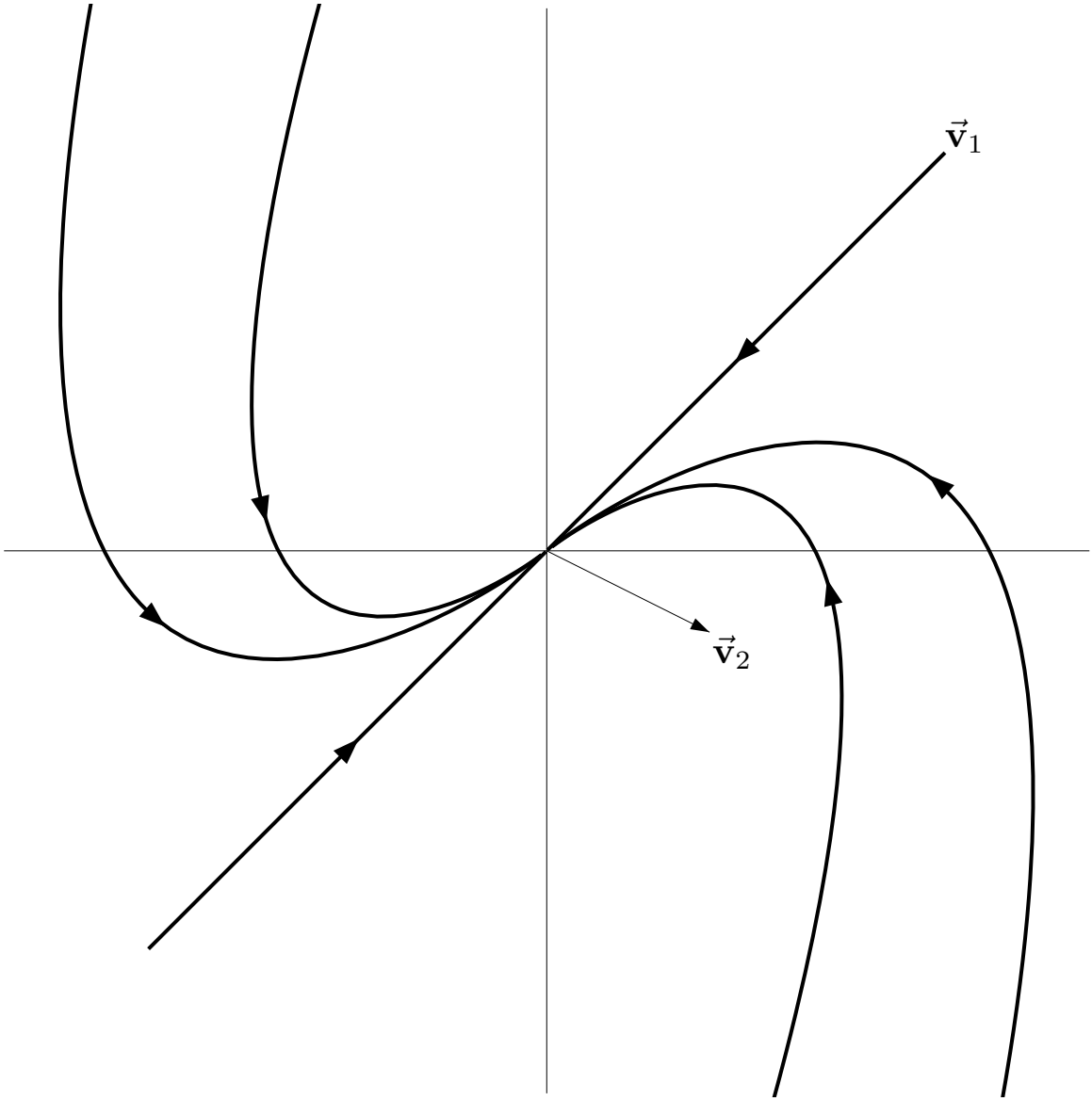


Unstable proper node

$\vec{\mathbf{x}} = c_1\vec{\mathbf{v}}_1 e^{\lambda_1 t} + c_2\vec{\mathbf{v}}_2 e^{\lambda_2 t}$

with $\lambda_1 = \lambda_2 > 0$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0

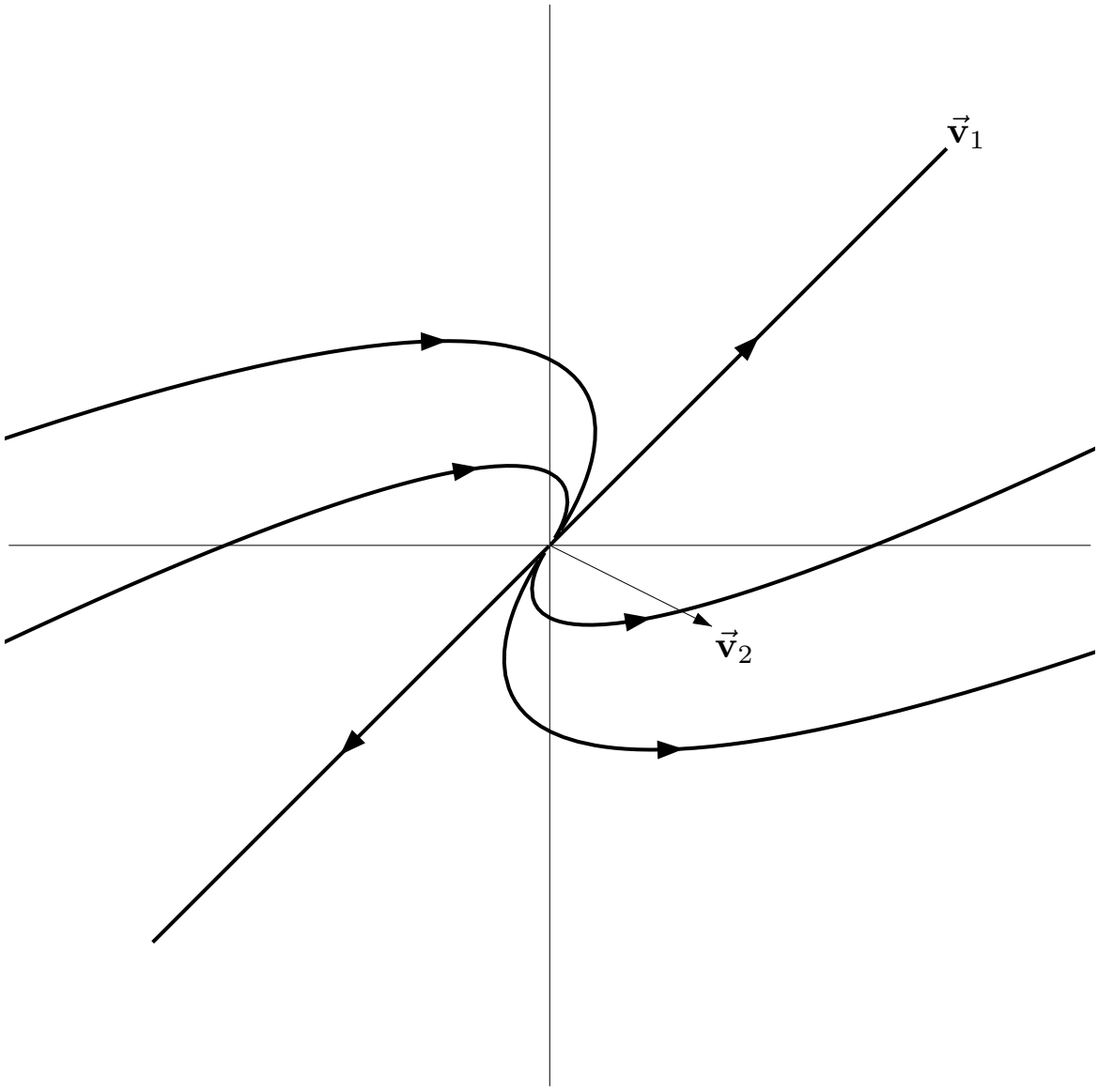


Asymptotically stable improper node

$$\vec{\mathbf{x}} = (c_1 + c_2 t)\vec{\mathbf{v}}_1 e^{\lambda t} + c_2 \vec{\mathbf{v}}_2 e^{\lambda t}$$

with $\lambda < 0$

Behaviour of Solutions of $\vec{\mathbf{x}}' = A\vec{\mathbf{x}}$ for $\vec{\mathbf{x}}$ near 0



Unstable improper node

$$\vec{\mathbf{x}} = (c_1 + c_2 t)\vec{\mathbf{v}}_1 e^{\lambda t} + c_2 \vec{\mathbf{v}}_2 e^{\lambda t}$$

with $\lambda > 0$