สรุป ∇V ในพิกัดต่าง ๆ

พิกัดฉาก	$\nabla V = \vec{a}_x \frac{\partial V}{\partial x} + \vec{a}_y \frac{\partial V}{\partial y} + \vec{a}_z \frac{\partial V}{\partial z}$
พิกัดทรงกระบอก	$\nabla V = \vec{a}_\rho \frac{\partial V}{\partial \rho} + \vec{a}_\phi \frac{\partial V}{\rho \partial \phi} + \vec{a}_z \frac{\partial V}{\partial z}$
พิกัดทรงกลม	$\nabla V = \vec{a}_r \frac{\partial V}{\partial r} + \vec{a}_\theta \frac{1}{r}\frac{\partial V}{\partial \theta} + \vec{a}_\phi \frac{1}{r\sin\theta}\frac{\partial V}{\partial \phi}$

สรุปไดเวอร์เจน $\nabla \cdot \vec{A} = div\vec{A}$

พิกัดฉาก	$div\vec{A} = \frac{\partial A_x}{\partial x} + \frac{\partial A_y}{\partial y} + \frac{\partial A_z}{\partial z}$
พิกัดทรงกระบอก	$div\vec{A} = \frac{1}{\rho}\frac{\partial}{\partial \rho}\left(\rho A_\rho\right) + \frac{1}{\rho}\frac{\partial}{\partial \phi}\left(A_\phi\right) + \frac{\partial}{\partial z}\left(A_z\right)$
พิกัดทรงกลม	$div\vec{A} = \frac{1}{r^2}\frac{\partial}{\partial r}\left(r^2 A_r\right) + \frac{1}{r\sin\theta}\frac{\partial}{\partial \theta}\left(A_\theta \sin\theta\right) + \frac{1}{r\sin\theta}\frac{\partial}{\partial \phi}\left(A_\phi\right)$

เคิร์ลระบบต่าง ๆ

พิกัดฉาก

$$\nabla \times \vec{A} = \vec{a}_x \left(\nabla \times \vec{A}\right)_x + \vec{a}_y \left(\nabla \times \vec{A}\right)_y + \vec{a}_z \left(\nabla \times \vec{A}\right)_z$$

$$\nabla \times \vec{A} = \vec{a}_x \left[\frac{\partial A_z}{\partial y} - \frac{\partial A_y}{\partial z}\right] + \vec{a}_y \left[\frac{\partial A_x}{\partial z} - \frac{\partial A_z}{\partial x}\right] + \vec{a}_z \left[\frac{\partial A_y}{\partial x} - \frac{\partial A_x}{\partial y}\right]$$

$$\nabla \times \vec{A} = \begin{vmatrix} \vec{a}_x & \vec{a}_y & \vec{a}_z \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial x} & \frac{\partial}{\partial x} \\ A_x & A_y & A_z \end{vmatrix}$$

พิกัดทรงกระบอก

$$\nabla \times \vec{A} = \vec{a}_\rho \left[\frac{1}{\rho}\frac{\partial A_z}{\partial \phi} - \frac{\partial A_\phi}{\partial z}\right] + \vec{a}_\phi \left[\frac{\partial A_\rho}{\partial z} - \frac{\partial A_z}{\partial \rho}\right] + \frac{1}{\rho}\vec{a}_z \left[\frac{\partial A_z}{\partial \phi} - \frac{\partial A_\phi}{\partial z}\right]$$

หรือ

$$\nabla \times \vec{A} = \begin{vmatrix} \frac{1}{\rho}\vec{a}_\rho & \vec{a}_\phi & \frac{1}{\rho}\vec{a}_z \\ \frac{\partial}{\partial \rho} & \frac{\partial}{\partial \phi} & \frac{\partial}{\partial z} \\ A_\rho & \rho A_\phi & A_z \end{vmatrix}$$

พิกัดทรงกลม $\nabla\times\vec{A}=\frac{1}{r\sin\theta}\left[\frac{\partial\left(\sin\theta A_\phi\right)}{\partial\theta}-\frac{\partial\left(A_\theta\right)}{\partial\phi}\right]\vec{a}_r+\frac{1}{r}\left[\frac{1}{\sin\theta}\frac{\partial\left(A_r\right)}{\partial\phi}-\frac{\partial\left(rA_\phi\right)}{\partial r}\right]\vec{a}_\theta$

$$+\frac{1}{r}\left[\frac{\partial\left(rA_\theta\right)}{\partial r}-\frac{\partial\left(A_r\right)}{\partial\theta}\right]\vec{a}_\theta$$

หรือ

$$\nabla\times\vec{A}=\begin{vmatrix}\frac{1}{r^2\sin\theta}\vec{a}_r & \frac{1}{r\sin\theta}\vec{a}_\theta & \frac{1}{r}\vec{a}_\phi\\ \frac{\partial}{\partial r} & \frac{\partial}{\partial\theta} & \frac{\partial}{\partial\phi}\\ A_r & rA_\theta & r\sin\theta A_\phi\end{vmatrix}$$