Differential Forms of the Gradient

$$grad\Phi = \nabla\Phi$$

Cartesian

$$\vec{i}\frac{\partial\Phi}{\partial x}+\vec{j}\frac{\partial\Phi}{\partial y}+\vec{k}\frac{\partial\Phi}{\partial z} = \left(\vec{i}\frac{\partial}{\partial x}+\vec{j}\frac{\partial}{\partial y}+\vec{k}\frac{\partial}{\partial z}\right)\Phi$$

Cylindrical

$$\vec{e}_r\frac{\partial\Phi}{\partial r}+\frac{\vec{e}_\theta}{r}\frac{\partial\Phi}{\partial\theta}+\vec{e}_z\frac{\partial\Phi}{\partial z} = \left(\vec{e}_r\frac{\partial}{\partial r}+\frac{\vec{e}_\theta}{r}\frac{\partial}{\partial\theta}+\vec{e}_z\frac{\partial}{\partial z}\right)\Phi$$

Spherical

$$\vec{e}_r\frac{\partial\Phi}{\partial r}+\frac{\vec{e}_\theta}{r}\frac{\partial\Phi}{\partial\theta}+\frac{\vec{e}_\phi}{r\sin\theta}\frac{\partial\Phi}{\partial\phi} = \left(\vec{e}_r\frac{\partial}{\partial r}+\frac{\vec{e}_\theta}{r}\frac{\partial}{\partial\theta}+\frac{\vec{e}_\phi}{r\sin\theta}\frac{\partial}{\partial\phi}\right)\Phi$$

These differential forms define the vector operator ∇