Formulas list

For a sphere of radius a, $S = 4\pi a^2$ and $V = 4\pi a^3/3$
$A(x-x_0)+B(y-y_0)+C(z-z_0)=0$
$\sin^2(\theta)=\frac{1}{2}(1-\cos(2\theta))$, $\cos^2(\theta)=\frac{1}{2}(1+\cos(2\theta))$
$D_{\vec{u}}f(x,y,z)=\nabla f(x,y,z)\cdot\vec{u}$
$dA = r\,dr\,d\theta$
$x=\rho\cos(\theta)\sin(\phi)$, $y=\rho\sin(\theta)\sin(\phi)$, $z=\rho\cos(\phi)$, $dV=\rho^2\sin(\phi)\,d\rho\,d\phi\,d\theta$,
$\vec{r}_\phi\times\vec{r}_\theta = a\,\sin(\phi)(x\vec{\imath}+y\vec{\jmath}+z\vec{k})$, $\|\,\vec{r}_\phi\times\vec{r}_\theta\,\| = a^2\,\sin(\phi)$
$dS=\sqrt{1+g_x^2+g_y^2}\;dD$
$dS=\|\,\vec{r}_u\times\vec{r}_v\,\|\;dD$
$\iint_S\;\vec{F}\cdot d\vec{S}=\iint_S\;\vec{F}\cdot\vec{n}\;dS$
$\iint_S\;(P\,\vec{\imath}+Q\,\vec{\jmath}+R\,\vec{k})\cdot d\vec{S}=\iint_D\;-P\,g_x-Q\,g_y+R\;dD$
$\iint_S\;\vec{F}\cdot d\vec{S}=\iint_D\;\vec{F}\cdot(\vec{r}_u\times\vec{r}_v)\;dD$
$\int_C\;\vec{F}\cdot d\vec{r}=\iint_S\;\mathrm{curl}(\vec{F})\cdot d\vec{S}$
$\iint_S\;\vec{F}\cdot d\vec{S}=\iiint_E\mathrm{div}(\vec{F})\,dV$