CONVERSION BETWEEN 3-DIMENSIONAL COORDINATES

	Cartesian	Cylindrical	Spherical
Cartesian		$x = r\cos\theta$ $y = r\sin\theta$ $z = z$	$x = \rho\sin\varphi\cos\theta$ $y = \rho\sin\varphi\sin\theta$ $z = \rho\cos\varphi$
Cylindrical	$r = \sqrt{x^2 + y^2}$ $\tan\theta = y/x$ $z = z$		$r = \rho\sin\varphi$ $\theta = \theta$ $z = \rho\cos\varphi$
Spherical	$\rho = \sqrt{x^2 + y^2 + z^2}$ $\tan\varphi = \sqrt{x^2 + y^2}/z$ $\tan\theta = y/x$	$\rho = \sqrt{r^2 + z^2}$ $\tan\varphi = r/z$ $\theta = \theta$	