

Math 223: Calculus III  
Coordinate Conversion Tables

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Cylindrical to rectangular	Rectangular to cylindrical
$x = r \cos(\theta)$	$r^2 = x^2 + y^2$
$y = r \sin(\theta)$	$\tan(\theta) = \frac{y}{x}$
$z = z$	$z = z$

Spherical to rectangular	Rectangular to spherical
$x = \rho \sin(\phi) \cos(\theta)$	$\rho^2 = x^2 + y^2 + z^2$
$y = \rho \sin(\phi) \sin(\theta)$	$\tan(\theta) = \frac{y}{x}$
$z = \rho \cos(\phi)$	$\cos(\phi) = \frac{z}{\rho}$

Spherical to cylindrical	Cylindrical to spherical
$r = \rho \sin(\phi)$	$\rho^2 = r^2 + z^2$
$\theta = \theta$	$\theta = \theta$
$z = \rho \cos(\phi)$	$\cos(\phi) = \frac{z}{\rho}$