Assignment

Read: Section 10.2 – Polar Coordinates
Section 13.5 – Cylindrical and Spherical Coordinates
Lesson 1 in Study Guide

Try:
§10.2 # 27, 29, 31, 33, 35
§13.5 # 11,13, 35, 37
Start work on assignments 1 and 2 on MyMathLab

Polar Coordinates

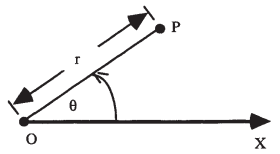


Figure 1: The Polar Coordinate System.

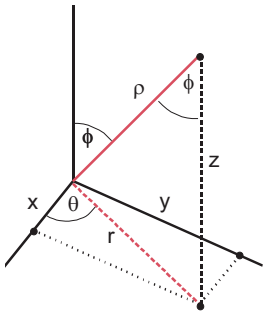
$x = r\cos\theta \qquad y = r\sin\theta$

$x^2 + y^2 = r^2 \qquad \tan\theta = \dfrac{y}{x}$

Cylindrical, Spherical Coordinates

13.5 – cylindrical, spherical coordinates.
Print out the next page to have all the conversion expressions in one place.

Coordinate Systems



Cylindrical (r, θ, z)

$x = r\cos\theta \quad y = r\sin\theta \quad z = z$

$x^2 + y^2 = r^2 \qquad \tan\theta = \dfrac{y}{x}$

Spherical (ρ, θ, ϕ)

$z = \rho\cos\phi \qquad r = \rho\sin\phi$

$x = \rho\sin\phi\cos\theta$
$y = \rho\sin\phi\sin\theta$

$\rho^2 = x^2 + y^2 + z^2$

$\sin\phi = \dfrac{r}{\rho} \qquad \cos\phi = \dfrac{z}{\rho}$

$dV = dx\,dy\,dz = r\,dz\,dr\,d\theta = \rho^2\sin\phi\,d\rho\,d\phi\,d\theta$