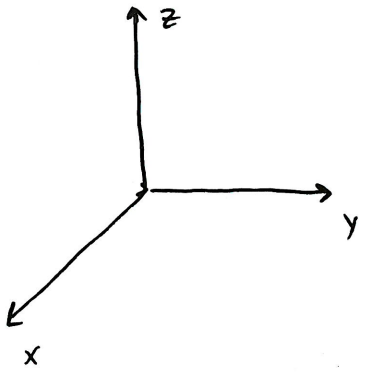
Section 15.9 - Spherical Coordinates

MVC

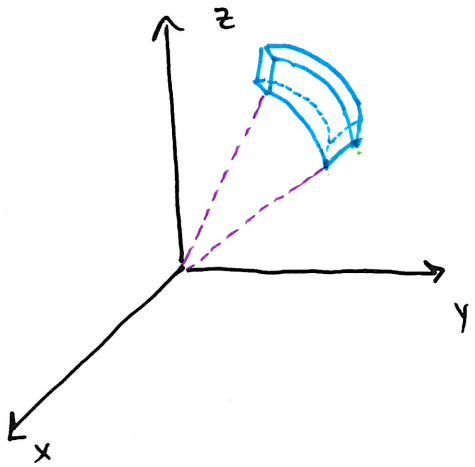
★ Useful for triple integrals over regions involving spheres or regions that are spherical.



Example Plot $(2, \pi/4, \pi/3)$ and find the rectangular coordinates.

Example Convert $(0, 2\sqrt{3}, -2)$ to spherical coordinates.

- Triple Integral in Spherical Coordinates:



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Example Use spherical coordinates to find the volume of the solid above $z = \sqrt{x^2 + y^2}$ and below $x^2 + y^2 + z^2 = z$.

- Extra Examples

#17. Sketch the solid whose volume is given by $\int_0^{\pi/6} \int_0^{\pi/2} \int_0^3 \rho^2 \sin\phi \, d\rho \, d\theta \, d\phi$

#35. Find the volume and centroid of the solid E that lies above the cone $z = \sqrt{x^2 + y^2}$ and below the sphere $x^2 + y^2 + z^2 = 1$.