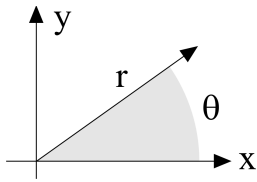


**Cartesianas a polares**

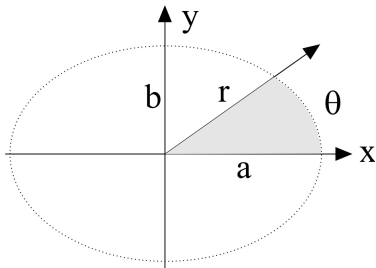


$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$\iint f(x, y) dx dy = \iint g(r, \theta) r dr d\theta$$

**Cartesianas a elípticas**

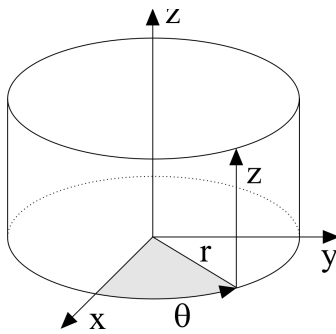


$$x = a r \cos \theta$$

$$y = b r \sin \theta$$

$$\iint f(x, y) dx dy = \iint g(r, \theta) a b r dr d\theta$$

**Cartesianas a cilíndricas**



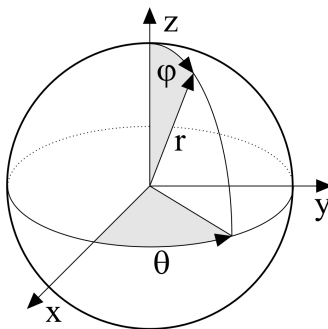
$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$z = z$$

$$\iiint f(x, y, z) dx dy dz = \iiint g(r, \theta, z) r dr d\theta dz$$

**Cartesianas a esféricas**



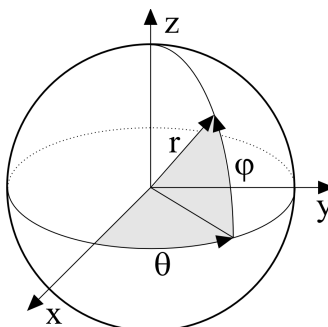
$\varphi$  = Colatitud, ángulo polar

$$x = r \sin \varphi \cos \theta$$

$$y = r \sin \varphi \sin \theta$$

$$z = r \cos \varphi$$

$$\iiint f(x, y, z) dx dy dz = \iiint g(r, \theta, \varphi) r^2 \sin \varphi dr d\varphi d\theta$$



$\varphi$  = Latitud, declinación

$$x = r \cos \varphi \cos \theta$$

$$y = r \cos \varphi \sin \theta$$

$$z = r \sin \varphi$$

$$\iiint f(x, y, z) dx dy dz = \iiint g(r, \theta, \varphi) r^2 \cos \varphi dr d\varphi d\theta$$