$ds^2 = dx^2 + dy^2 + dz^2$

Cylindrical: $X=r\cos\theta$, $y=r\sin\theta$, z=z $dx=dr\cos\theta-r\sin\theta d\theta$ $dy=dr\sin\theta+r\cos\theta d\theta$ $ds^2=dr^2+r^2d\theta^2+dz^2$

Spherical: X= r cospsino y= rsinpsino Z= rcoso

dx = dr cos \$5 in 0 - vsin \$5 m 0 d\$ + vcos \$p cos 0 d 0

dy = dr sm \$5 m 0 + v cos \$5 in 0 d\$ + vsin \$ cos 0 d 0

dz = dv cos 0 - v sin 0 d 0

 $ds^{2} = dr^{2}sin^{2}\theta + r^{2}sin^{2}\theta d\theta^{2} + r^{2}cos^{2}\theta d\theta^{2}$ $+ dr^{2}cos^{2}\theta + r^{2}sin^{2}\theta d\theta^{2}$ $+ 2rcos\theta sin\theta drd\theta - 2rcos\theta sin\theta drd\theta$

ds2 = dr2 + r2 d02 + r2sm20 dp2

On the surface of a cylinder, r= constant => dr=0
On the surface of a sphere, r= constant => dr=0