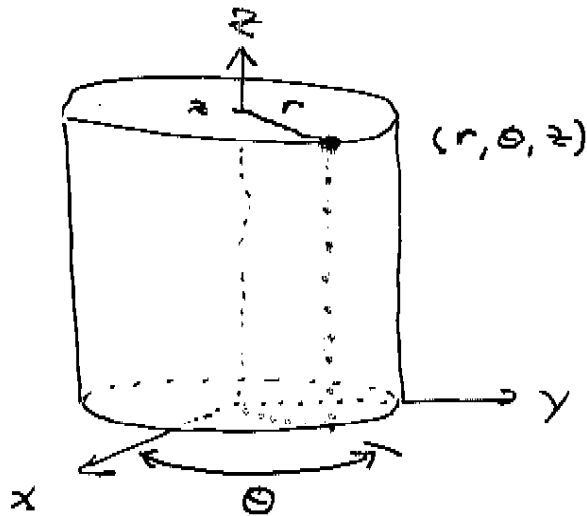


15.7
1/2

15.7: Triple Integrals in Cylindrical Coords

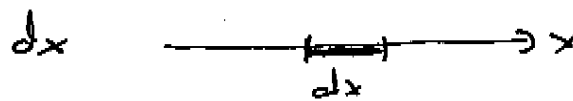
cylindrical
coordinates

(sweet mathematica
visualization).



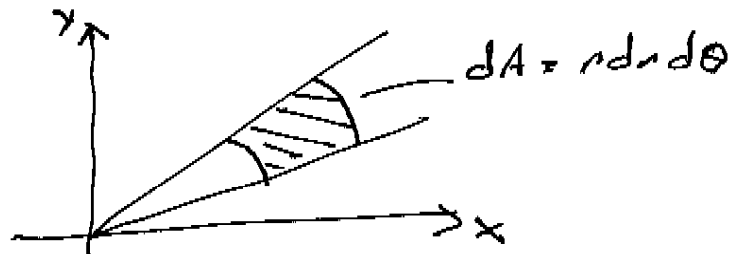
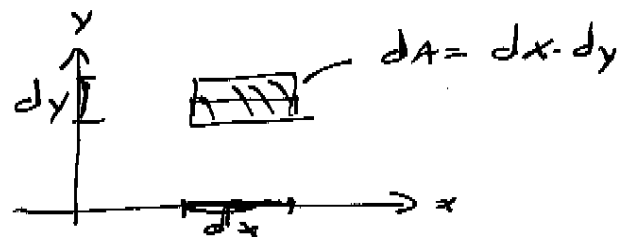
Differentials

single integral
variable :



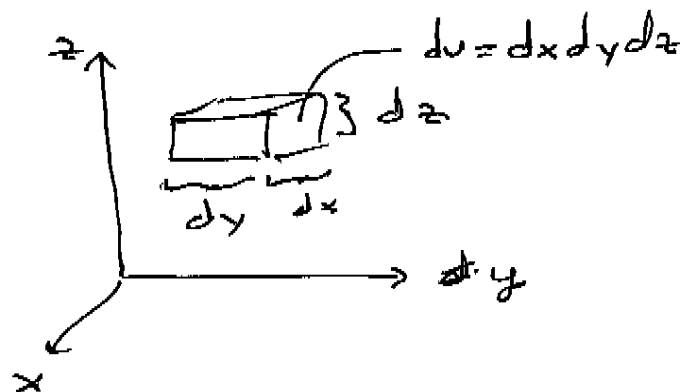
double integral :

dA

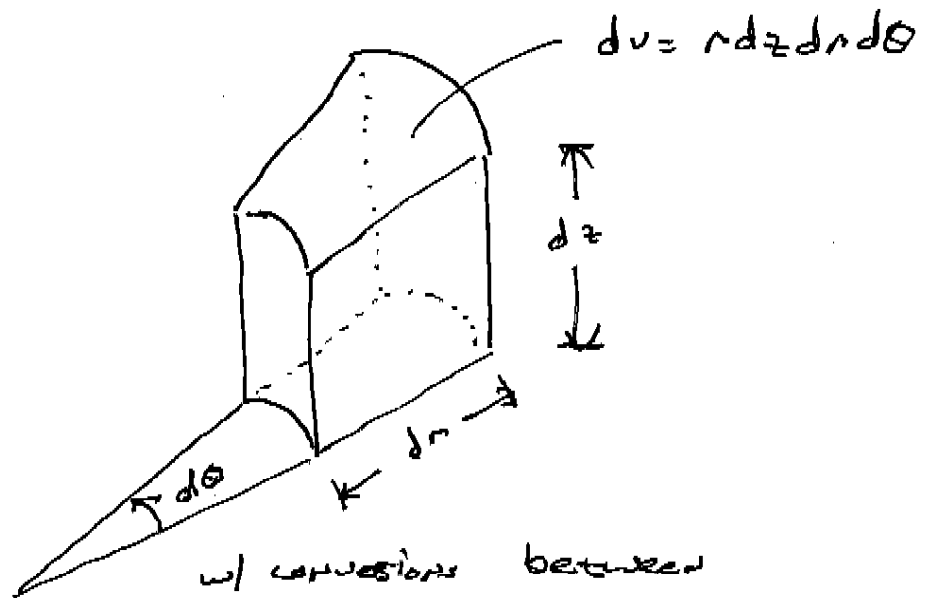


triple integrals :

dv



15.7
2/2



w/ conversions between
coord systems of

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

$$x^2 + y^2 = r^2 ; \quad \frac{y}{x} = \tan \theta$$

Ex 1: (A) Sketch the solid whose volume is given

$$\text{by } \int_0^{\pi/2} \int_0^2 \int_0^{9-r^2} 1 \cdot r \, dz \, dr \, d\theta$$

(B) Express the volume using cartesian coords

(C) calculate the volume whichever way seems easier.