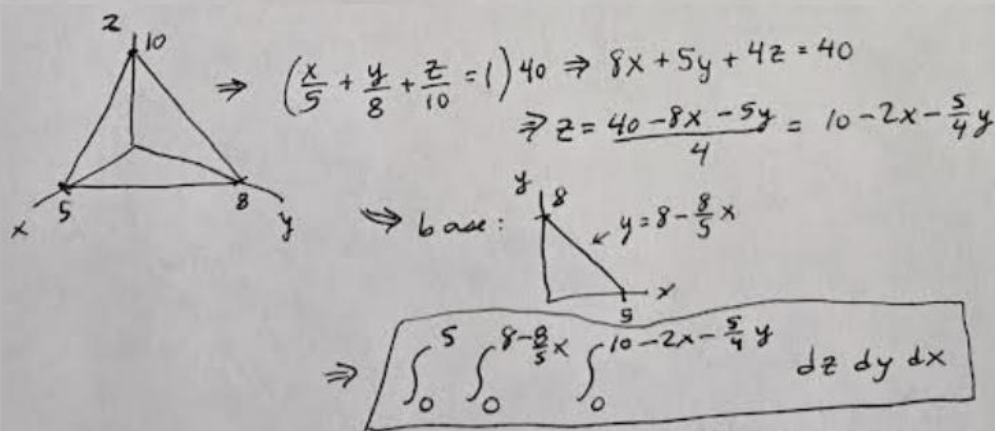


QUIZ 8

4-1-25

- ① Set up a triple integral that gives the volume below the plane with intercepts $(5, 0, 0)$, $(0, 8, 0)$ and $(0, 0, 10)$, in the first octant $(x, y, z \geq 0)$. Just set it up, do not solve it. Use the $dz dy dx$ ordering. (6 pts)



- ② Rewrite the following triple integral into spherical form. (do not solve it). (4 pts)

$$\int_{-8}^8 \int_0^{\sqrt{64-x^2}} \int_0^{\sqrt{64-x^2-y^2}} \frac{1}{\sqrt{x^2+y^2+z^2}} dz dy dx$$

1) shape is a quartersphere
 $0 \leq \rho \leq 8, 0 \leq \theta \leq \pi, 0 \leq \varphi \leq \frac{\pi}{2}$

integrand: $\frac{1}{\sqrt{x^2+y^2+z^2}} = \frac{1}{\sqrt{\rho^2}} = \frac{1}{\rho} \left\{ \frac{1}{\rho} (\rho^2 \sin \varphi) = \rho \sin \varphi \right\}$

$$\int_0^{\frac{\pi}{2}} \int_0^{\pi} \int_0^8 \rho \sin \varphi d\rho d\theta d\varphi$$