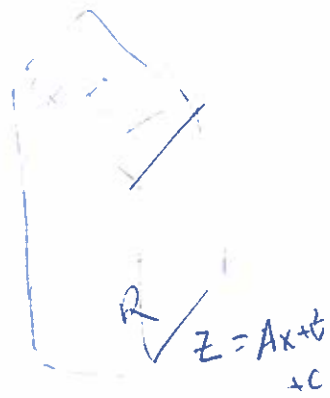
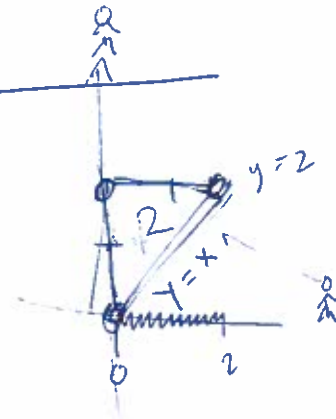


Surface Area

$$S = \iint_R \sqrt{(f_x)^2 + (f_y)^2 + 1} dA$$

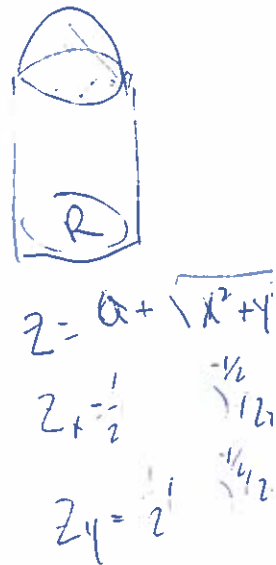


Ex $z = y^2 + 9x$



$$\int_0^2 \int_x^2 \sqrt{(9)^2 + (2y)^2 + 1} dy dx$$

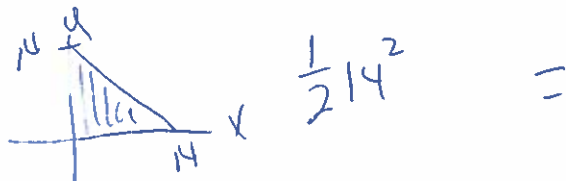
$$\sqrt{82 + 4y^2} dy$$

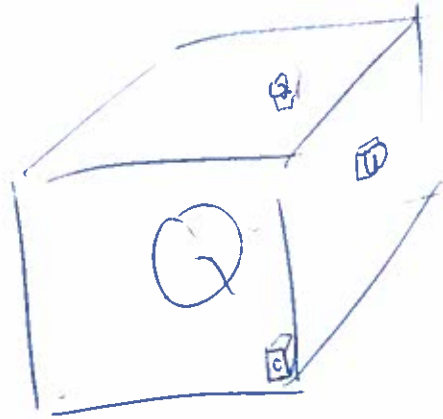


$$z = 14 - x - y$$

$$z_x = -1 \quad z_y = -1$$

$$S = \iint_R \sqrt{3} dA = \sqrt{3} \iint_R dA = \frac{\sqrt{3} \cdot 14^2}{2}$$

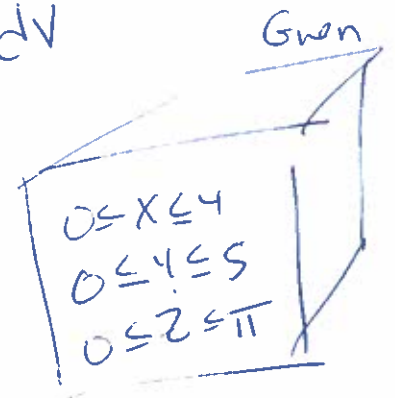




$$\iiint_Q f(x,y,z) dV$$

$$M = \iiint_Q \rho(x,y,z) dV$$

$$\iiint_Q 2x e^y \sin z dV$$



$$\int_0^\pi \int_0^5 \int_0^4 2x e^y \sin z dx dy dz$$

$$2 \int_0^4 x dx \cdot \int_0^5 e^y dy \cdot \int_0^\pi \sin z dz$$

$$2 \cdot \frac{x^2}{2} \Big|_0^4 \quad e^y \Big|_0^5 \quad -\cos(z) \Big|_0^\pi$$

$$e^5 - e^0 \quad -(\cos \pi + \cos 0)$$

$$16 (e^5 - 1) \cdot 2$$

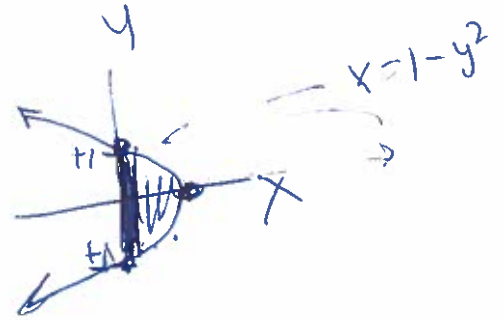
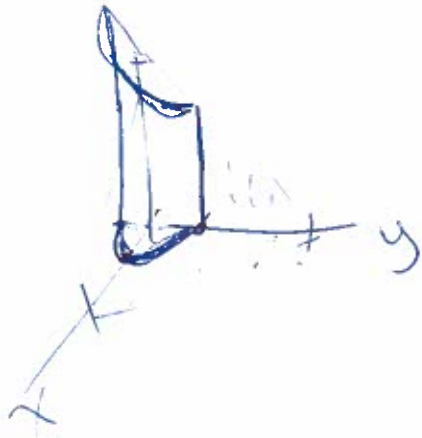
$$32(e^5 - 1)$$

$$2x + y + z = 4$$

$$x = 1 - y^2$$

$$z = 0$$

$$x = 0$$



$\int \int \int$