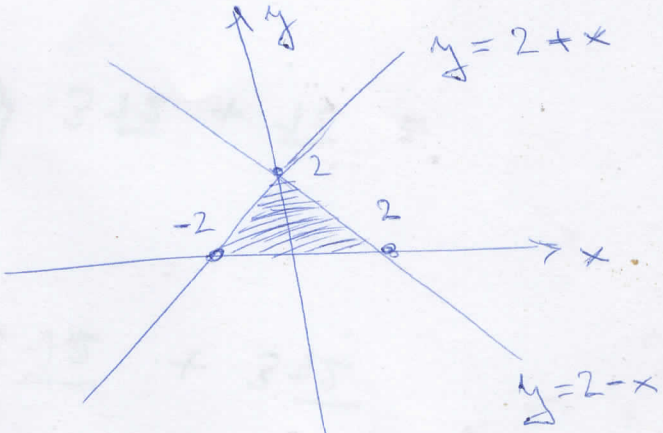
1. $\iint_D (x+y)^3 \,dx\,dy \overset{\text{F.V.}}{=} \int_0^2 \int_{y-2}^{2-y} (x+y)^3 \,dx\,dy =$

$$= \int_0^2 \left[\frac{(x+y)^4}{4} \right]_{y-2}^{2-y} dy$$

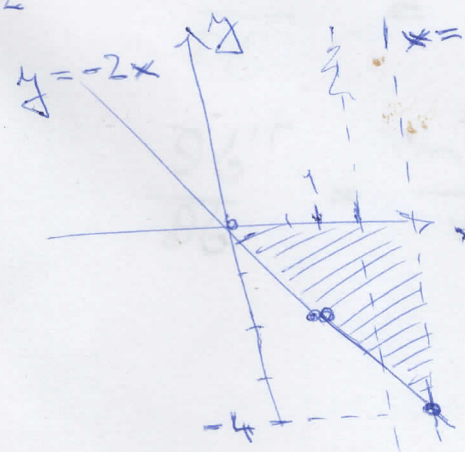


$$= \frac{1}{4} \int_0^2 \left(16 - (2y-2)^4 \right) dy$$

$$= \frac{1}{4} \cdot 16 \cdot \int_0^2 \left(1 - (y-1)^4 \right) dy$$

$$= 4 \cdot \left[y - \frac{(y-1)^5}{5} \right]_0^2 = 4 \cdot \left(2 - \frac{1}{5} + \frac{1}{5} \right) = \frac{32}{5}$$

2. $\int_{-4}^{0} \left(\int_{-\frac{x}{2}}^{2} \cos\left(\frac{\pi y}{4x} \right) dx \right) dy \overset{\text{F.V.}}{=} \int_0^2 \int_{-2x}^{0} \cos \frac{\pi y}{4x} \,dy\,dx =$



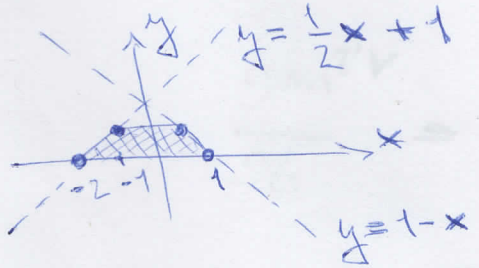
$$= \int_0^2 \left[\frac{4x}{\pi} \sin \frac{\pi y}{4x} \right]_{-2x}^{0} dx$$

$$= \int_0^2 \frac{4x}{\pi} \cdot \left(\underbrace{\sin 0}_{=0} - \underbrace{\sin\left(-\frac{\pi}{2}\right)}_{=-1} \right)$$

$$= \frac{4}{\pi} \cdot \int_0^2 x \,dx = \frac{4}{\pi} \left[\frac{x^2}{2} \right]_0^2$$

$$= \frac{8}{\pi}$$

3.



$$\int_0^{\frac{1}{2}} \int_{2y-2}^{1-y} \frac{1}{1-y} \,dx\,dy =$$

$$= \int_0^{\frac{1}{2}} \frac{1-y-(2y-2)}{1-y} \,dy = \int_0^{\frac{1}{2}} \frac{-3y+3}{1-y} \,dy = \int_0^{\frac{1}{2}} 3 \,dy = \frac{3}{2}$$