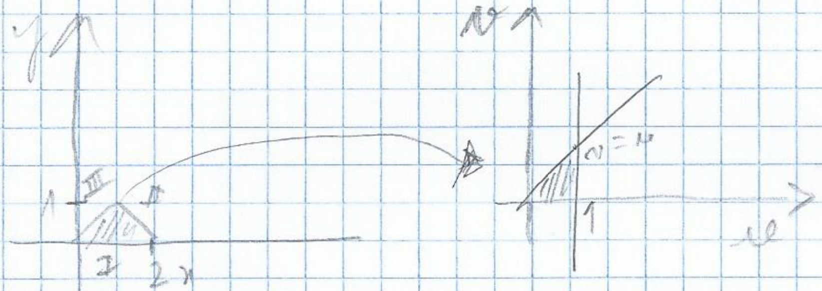
T.P.C. 8 compl. pg 471 - 1097

(a) Use a transf.

$$\begin{cases} u = \frac{1}{2}(x+y) \\ v = \frac{1}{2}(x-y) \end{cases}$$ para determinar

$$\iint_R \operatorname{sen} \tfrac{1}{2}(x+y) \cos \tfrac{1}{2}(x-y)\, dA$$ da região triangular R

com os vértices $(0,0)$, $(2,0)$, $(1,1)$



I) $0 \leq x \leq 2 \wedge y = 0$ $\begin{cases} u = \frac{1}{2}x \\ v = \frac{1}{2}x \end{cases} \Rightarrow u = v$

II) $y = -x + 2$

$$\begin{cases} 0 = m2 + b \\ 1 = m + b \end{cases} \quad \begin{cases} m = \frac{-b}{2} \\ 1 = -\frac{b}{2} + b \Leftrightarrow \end{cases} \quad \begin{cases} m = -1 \\ b = 2 \end{cases}$$

$$\begin{cases} u = \frac{1}{2}(x - x + 2) \Leftrightarrow \quad \underline{u = 1} \\ v = \frac{1}{2}(x + x - 2) \Leftrightarrow v = x - 1 \end{cases}$$

III) $y = x$ $\begin{cases} u = \frac{1}{2}(x + x) \Leftrightarrow u = x \\ v = \frac{1}{2}(x - x) \Leftrightarrow v = 0 \end{cases}$

$$\iint_R \operatorname{sen}\left(\tfrac{1}{2}(x+y)\right) \cos\left(\tfrac{1}{2}(x-y)\right) dA = \int_0^1 \int_0^u \operatorname{sen} u \cos v \cdot \left|\frac{\partial(x,y)}{\partial(u,v)}\right| dv\, du \quad =$$

Auxiliar:

$$\left|\frac{\partial(x,y)}{\partial(u,v)}\right| = \frac{1}{\partial(u,v)\ldots} = \frac{1}{\ldots} = \left|\frac{1}{\frac{1}{\ldots}\ \frac{1}{\ldots}}\right| = \frac{1}{\ldots} =$$