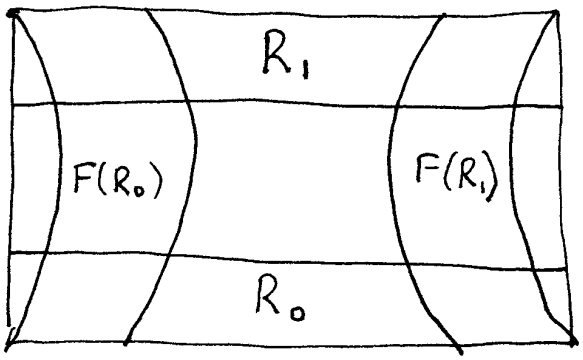
313-2 Final 2002

(4)



$$F(0,y) = \begin{pmatrix} \frac{1}{8}\sin(4\pi y) \\ 4y \end{pmatrix} \qquad 0 \le y \le \frac{1}{4}$$

This is a curve with 1st coord > 0
Second coordinate runs from 0 to 1.

$$F(1,y) = \begin{pmatrix} \frac{1}{4} + \frac{1}{8}\sin(4\pi y) \\ 4y \end{pmatrix} \qquad 0 \le y \le \frac{1}{4}.$$

Translated $\frac{1}{4}$ unit to the right.

$$F(x,0) = \begin{pmatrix} \frac{1}{4}x \\ 0 \end{pmatrix} \qquad 0 \le x \le 1 \quad \text{gives straight bottom}$$

$$F(x,\tfrac{1}{4}) = \begin{pmatrix} \frac{1}{4}x + \frac{1}{8}\sin(\pi) \\ 1 \end{pmatrix} = \begin{pmatrix} \frac{1}{4}x \\ 1 \end{pmatrix} \qquad 0 \le x \le 1.$$

These are the 4 sides of $F(R_0)$.

Image $F(R_1)$ is similar but

$$F\begin{pmatrix} 1 \\ y \end{pmatrix} = \begin{pmatrix} 1 - \frac{1}{8}\sin 4\pi(y - \frac{3}{4}) \\ 4y - 3 \end{pmatrix} \qquad \frac{3}{4} \le y \le 1.$$

1st coordinate is ≤ 1.

Gives a curve from $(1,0)$ to $(1,1)$

Vertical direction is expanding & it is taken across the vertical direction of R_0 & R_1.

Therefore correctly aligned & Markov partition.