

N1RECBOX

Modes of the rectangular box in two dimensions

Standing sine waves in x and y direction. Mode number and constants.

x direction n1 and a

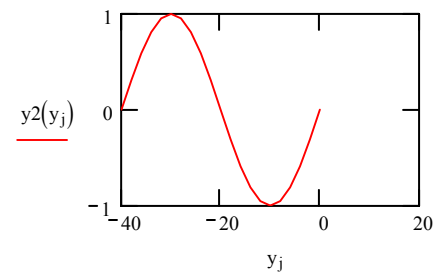
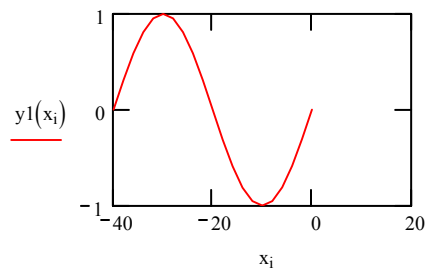
y direction n2 and b

The wave in each direction is shown and Contour and surface plots.

The square is also shown as surface plot.

$$\begin{aligned}
 i &:= 0..N & j &:= 0..N \\
 x_i &:= (-40) + 2.001 \cdot i & y_j &:= -40 + 2.0001 \cdot j & \lambda_1 &:= 2 \cdot \frac{a}{n_1} & \lambda_2 &:= 2 \cdot \frac{b}{n_2} \\
 y_1(x) &:= \sin\left(2 \cdot \pi \cdot \frac{x}{\lambda_1}\right) & y_2(y) &:= \sin\left(2 \cdot \pi \cdot \frac{y}{\lambda_2}\right)
 \end{aligned}$$

1. One dimension

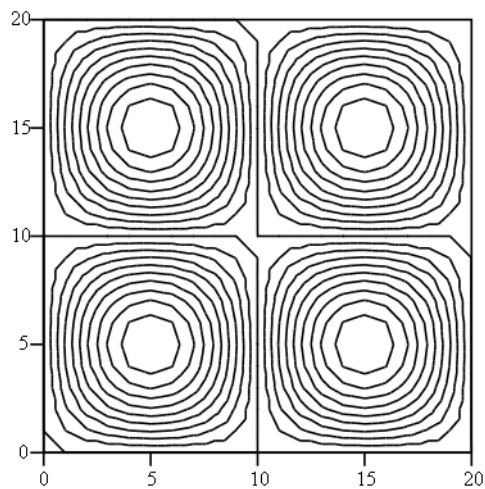


2. Amplitude, 2D

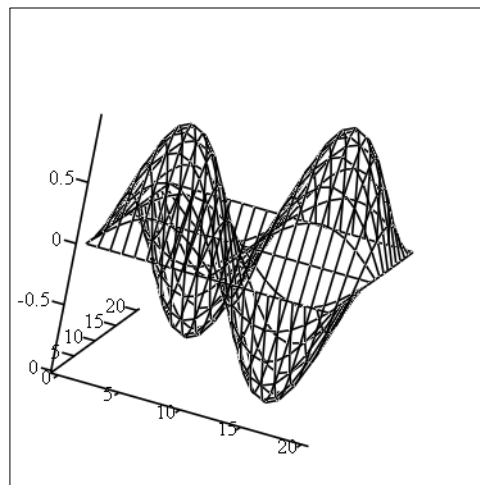
$$n_1 \equiv 2 \quad a \equiv 40$$

$$n_2 \equiv 2 \quad b \equiv 40 \quad N \equiv 20$$

$$M_{11,i,j} := y_1(x_i) \cdot y_2(y_j)$$



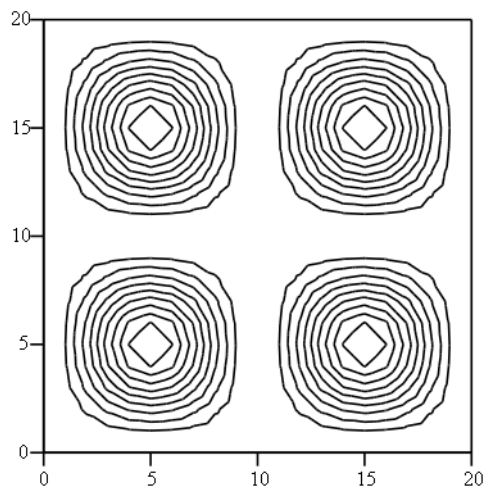
M11



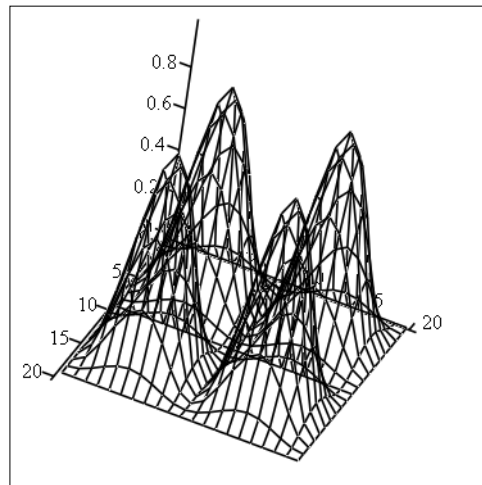
M11

3. Intensity, 2D

$$\text{MM11}_{i,j} := (y1(x_i) \cdot y2(y_j))^2$$



MM11



MM11