12ª Lista de Exercícios Métodos Matemáticos
(Eq. da Onda)
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Resolva:

1) $4y_{xx} = y_{tt}, \quad 0 < x < \pi, \quad t > 0;$
$y(0,t) = y(\pi,t) = 0, \quad y(x,0) = \frac{1}{10}Sen(2x),$
$y_t(x,0) = 0.$

$$Resp: \ y(x,t) = \frac{1}{10}Sen(2x)Cos(4t)$$

2) $y_{xx} = y_{tt}, \quad 0 < x < 1, \quad t > 0;$
$y(0,t) = y(1,t) = 0, \quad y(x,0) = \frac{1}{10}Sen(\pi x) - \frac{1}{20}Sen(3\pi x),$
$y_t(x,0) = 0.$

$$Resp: \ y(x,t) = \frac{1}{10}Sen(\pi x)Cos(\pi t) - \frac{1}{20}Sen(3\pi x)Cos(3\pi t)$$

3) $4y_{tt} = y_{xx}, \quad 0 < x < 2, \quad t > 0;$
$y(0,t) = y(2,t) = 0, \quad y(x,0) = \frac{1}{5}Sen(\pi x).Cos(\pi x),$
$y_t(x,0) = 0.$

$$Resp: \ y(x,t) = \frac{1}{10}Sen(2\pi x)Cos(\pi t)$$