

So solution is

$$u(x, t) = \frac{2lv}{\pi c} \sin\left(\frac{\pi t c}{2l}\right) \sin\left(\frac{\pi x}{2l}\right) \quad 1$$

which represents a standing wave. 1

(One node is at $x = 0$ and the next would be at $x = 2l$ were the equation defined over this interval. The solution is a superposition of two cosine waves travelling in opposite directions along the x -axis, i.e.

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$$u(x, t) = \frac{lv}{\pi c} \left[\cos \frac{\pi}{2l}(x - ct) - \cos \frac{\pi}{2l}(x + ct) \right] .)$$