

Exercise 6

Use the Laplace transform to solve

$$u_{tt} = c^2 u_{xx} + \cos \omega t \sin \pi x \quad \text{for } 0 < x < 1$$
$$u(0, t) = u(1, t) = u(x, 0) = u_t(x, 0) = 0.$$

Assume that $\omega > 0$ and be careful of the case $\omega = c\pi$. Check your answer by direct differentiation.