Q.1: Use d’Alembert’s formula to solve the wave equation $a^2 \frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial t^2}$, $-\infty < x < \infty$

and $u(x, 0) = f(x) = \sin(x)$, $u_t(x, 0) = g(x) = \cos(x)$. 
Q.2: Use Laplace transform to solve the wave equation $a^2 \frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial t^2}$ subject to the conditions

$u(0, t) = 0$, $u(\pi, t) = 0$, and $u(x, 0) = 0$, $u_t(x, 0) = 3 \cos(2x) + 2 \cos(3x)$. 