Homework - MTH 357

Instructions: Homework is to be neat and organized. **If it's messy it's wrong.** Answers without the necessary supporting work are worth 0. You may discuss problems with others but must always produce your own work and write your own solutions. Copying someone else's homework is considered cheating.

HW6, due 11/9

1. Verify that $u(x,t) = \cos 4t \sin 3x$ satisfies the wave equation for an appropriate choice of c.
2. Verify that $u(x,t) = e^{-25t} \sin \omega x$ satisfies the heat equation for an appropriate choice of c.
3. Verify that $u(x,t) = v(x+ct) + w(x-ct)$ satisfies the wave equation for any twice differentiable functions $v(z)$ and $w(z)$.
4. Verify that $u(x,y) = A \ln(x^2+y^2) + B$ satisfies the Laplace equation. Find A and B such that u satisfies the boundary conditions: $u = 7$ on the circle $x^2+y^2 = 1$ and $u = 0$ on the circle $x^2+y^2 = e^2$.