Partial differential equations - Check your knowledge

□ What is the difference between an ordinary and a partial differential equation? How do you recognize one from the other?

□ What is the order of a partial differential equation (PDE)? Do you know how to decide whether a PDE is linear, or homogeneous?

□ What does it mean for a function of more than one variable to be a solution to a given PDE? Given a PDE and a function, how do you check that the function is a solution to the PDE?

□ Would you be able to write down some of the PDEs we discussed in class? In particular, what is the wave equation? What is the heat equation? What is the Laplace equation?

□ Can you identify all of the steps to be followed when you use the method of separation of variables to solve a PDE on a finite interval?

□ What types of calculations are typically needed when solving a linear PDE by the method of separation of variables?

□ How do we use boundary conditions to find the constant that appears in the method of separation of variables? In what sense does this correspond to solving an eigenvalue problem?

□ Which method would you use if you had to solve a linear equation (such as the heat equation) on the whole line?

□ How is the dot product of two functions typically defined, in one and two dimensions?