

The goal of this thesis is to study Laplace's equation on a unit disc. The given function values on a unit circle can be interpreted as a  $2\pi$ -periodic function and the solution can be derived using Fourier method. We introduce general integer Sobolev spaces and their alternatives useful for describing functions on a unit disc and a unit circle. Using elementary methods, we show how they are related to each other. The same results are shown for fractional Sobolev spaces. The main result is that functions from some Sobolev space on a unit disc that solve Laplace's equation correspond to functions from a one half lower Sobolev space on a unit circle. These results can be used to show for a function from some Sobolev space on a unit circle in how strong norm the solution of Laplace's equation converges to the given function.