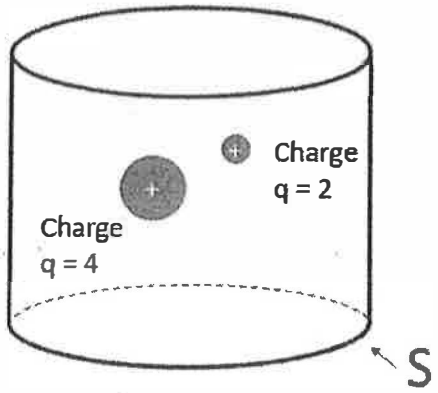
Vector Calculus and PDEs 37336
Skills Test 8

Please attempt all the questions - you are allowed a single physical "cheat-sheet" when attempting the questions. Remember that the idea is to get feedback on your current level. An honest attempt without looking up anything will be most effective at this. Non-programmable calculators can be used for basic arithmetical operations.

1. Consider the charge distribution shown (units are in Coulombs):



Use Gauss's law to compute the flux integral of the electric field $\mathbf{E}$ through the surface S.

2. Find a potential V for the electric field given by

$$\mathbf{E}(x, y, z) = Cx^2\hat{\mathbf{j}}$$

where C is a constant.