

ICEO and ICEP

18.095: IAP Mathematics Lecture Series 2006
Brief Solutions to Homework Problems for Lecture 2

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1. The result follows easily from surface charge density, $q = Q/4\pi a^2$, for a sphere.
2. The boundary condition is obviously satisfied, since the second term vanishes at ∞ . The first term is linear and thus vanishes under second derivatives. The second term satisfies Laplace's equation after (carefully) taking partial derivatives.
3. After some calculus, the answer is $U_y = -(9/64)U_{ICEO}$.