

Phys221 Assignment #1

Due: 10:20am Friday May 11, 2012

1. Textbook page 44, # 2.5.

2. A solid sphere with a radius R is uniformly charged. The charge density (charge per unit volume) is ρ . Figure A below depicts its cross section on the x - y plane. The centre of the sphere is at the origin.

(a) Determine the electric field E at point $P(2R/3, 0, 0)$.

(b) A spherical cavity of radius $R/2$ is created as shown in figure B. The centre of the cavity is located at $(R/2, 0, 0)$. Determine the electric field inside the cavity at point $P(2R/3, 0, 0)$.

(c) If the cavity inside the sphere has a radius w and the centre of the cavity is located at $(a, b, 0)$, find the electric field at a point $(x, y, 0)$ inside the cavity.

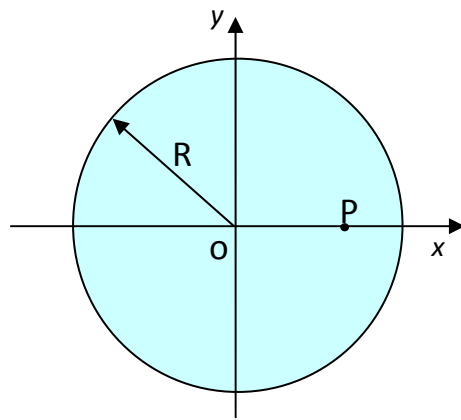


Figure A

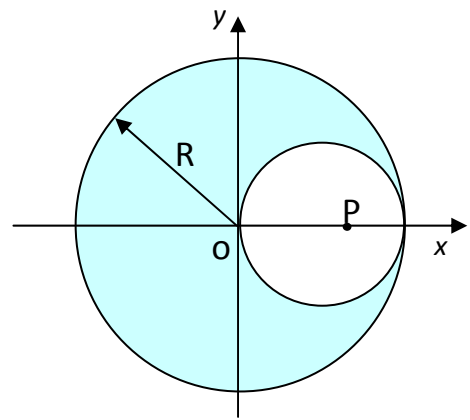


Figure B