Phys221 Assignment #3

Due: 9:20am Friday June 4, 2010

1. Textbook page 112: #4.28;

2. Textbook page 112: #4.30;

3. 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.
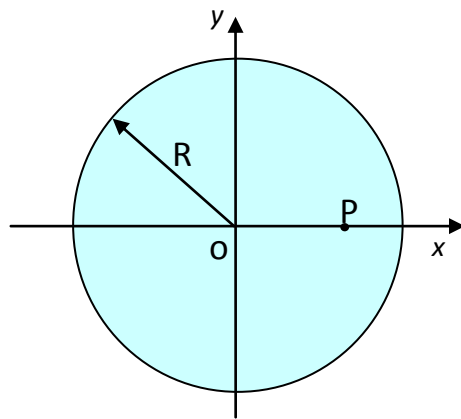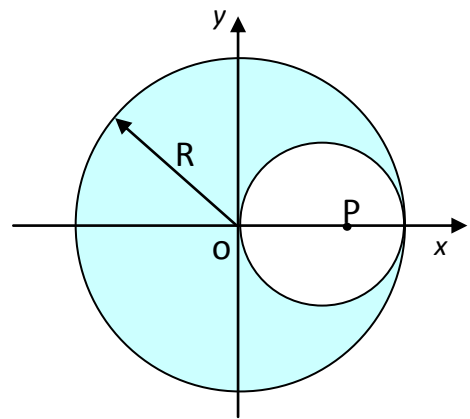
Figure A

Figure B