

## Homework 8

Due Tuesday 4/15/2014 - at beginning of class

### Griffiths' 4 Problems

**5.17** (Griffiths' 3rd Edition Problem 5.16)

**5.23** (Griffiths' 3rd Edition Problem 5.22) You only need to find the potential. You do not need to take the curl to find the field.

**5.24** (Griffiths' 3rd Edition Problem 5.23)

**5.37(a)** (Griffiths' 3rd Edition Problem 5.35)

### Additional Problems

**E.8.1** A non-uniform current  $\vec{J} = \gamma s^2 \hat{z}$  flows in the  $\hat{z}$  direction in the region  $a < s < b$ .  $\gamma$  is a constant. Compute the magnetic field everywhere.

**E.8.2** Compute the vector potential at the center of a square sheet of current  $\vec{K} = K_0 \hat{y}$  where the current extends from  $x = -a$  to  $a$  and  $y = -a$  to  $a$  in the  $x - y$  plane.  $K_0$  is a constant.

**E.8.3** A flat square loop of wire with side length  $\ell$  in in the  $x - y$  plane centered at the origin. The loop carries a current  $I$  in the clockwise direction when viewed from the positive  $z$  axis. Compute the vector potential at a point a distance  $R > \ell$  along the  $x$  axis.