Exercise 1

Show that a possible choice of the vector potential for a constant magnetic field $\vec{B}$ is given by $\vec{A} = (1/2)\vec{B} \times \vec{r}$. Can you construct any other $vec{A}$?

(Hint : Take $\vec{B}$ in z-direction, express $vec{A}$ in component form and take its curl.)

Exercise 2

Obtain an expression for the vector potential inside a cylindrical wire of radius R carrying a current I.

(Ans. $-\mu_0 I r^2/4\pi R^2$)