

**Answer keys for exercises in Assignment 6**

5) At the center of the semi-circular arc  $B = 6.3 \times 10^{-4} T$

At the center of the circular arc  $B = 0$

6)  $\vec{B}_{in} = \frac{\mu_0 I r}{2\pi R^2} \hat{\phi}$ ;  $\vec{B}_{out} = \frac{\mu_0 I}{2\pi r} \hat{\phi}$ ,  $r$  being the distance from the center axis of the wire.

$(\nabla \times B)_{in} = \mu_0 \vec{J}$ ;  $(\nabla \times B)_{out} = 0$

7)  $\vec{F} = -ILB\hat{z}$

8)  $F(s) = \frac{\mu_0 I^2 a^2}{2\pi s(s+a)}$ ,  $s$  being the distance of the arm of the square loop parallel and nearest to the wire, with the net force pointing vertically away from the wire.