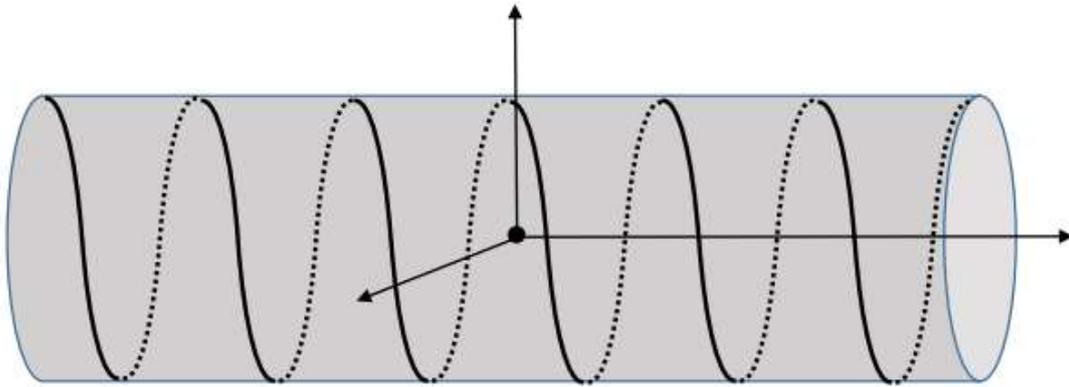


Problem 2



- 1) Calculate the axial component of the vector potential \vec{A} at the center of a helix of $2N$ turns, of radius R , and of the length $2H$, carrying a current I . (You need to calculate *only* the axial component of the vector potential, and *only* at the origin.)
- 2) Show that the result (for the axial component of the vector potential at the origin) is the same as that for a single wire of length $2H$ along the side of the helix that carries a current I . Why is this so?
- 3) Is it possible to use this result to calculate the axial component of \vec{B} at the center?
- 4) Show that the axial component of \vec{B} at the center of the helix is

$$\frac{\mu_0 IN}{\sqrt{R^2 + H^2}}$$