2) \[ J = \frac{I}{A} = \frac{I_0}{\pi R_0^2} + 10 \]

\[ J = \frac{I}{V} = \frac{I_0}{\pi R_0^2} - 4 \text{ for } \text{directly by } 0 \]
\[ -2 \text{ for } J = \frac{I_0}{2\pi R_0} \]

b) \[ \oint \vec{B} \cdot d\vec{l} = \mu_0 I_0 \]
\[ B_2 = \frac{\mu_0 I_0}{\pi R_0^2} \]
\[ B = \frac{\mu_0 I_0 3}{\pi^2 R_0} = \frac{\mu_0 I_0}{6\pi R_0} + 10 \]

correctly, I've only done \(-7\)
not square \(3 - \#2\)

the answer I got having a different value \(\phi R_0 = \#6\)
not doing \(\oint \vec{B} \cdot d\vec{l} = -7\)

\(c) \quad B = \frac{\mu_0 I_0}{2\pi r} \quad \text{outside using } B = \frac{\mu_0 E}{2\pi R_0} - 10\)

\[ u = \int \frac{1}{2} B^2 dV = \int_{R_0}^{3R_0} \frac{\mu_0 I_0^2 0.2r}{2\pi R_0^2} r^2 dr = \frac{\mu_0 I_0^2}{4\pi} \int_{R_0}^{3R_0} \frac{r}{1} dr = \frac{\mu_0 I_0^2 R_0^3}{4\pi} \]

\[ \frac{u}{B} = \frac{\mu_0 I_0^2}{4\pi} \quad \text{different } r = -6 \]

forgetting to take \(B^2 = 5\)