Special Problem 9-3.2

A single square loop of wire is centered at the origin, and lies entirely on the x-y plane. Each side of the square loop is 2 m in length.

There is a current of 2 Amperes flowing in this loop, which creates a magnetic flux density within the loop of approximately:

\[ B(\vec{r}) = \frac{\mu_0}{(z^2 + 1)} \hat{a}_z \ \text{Wb/m}^2 \]

A. Determine the total amount of magnetic flux passing through this loop.

B. Determine the inductance of this loop.