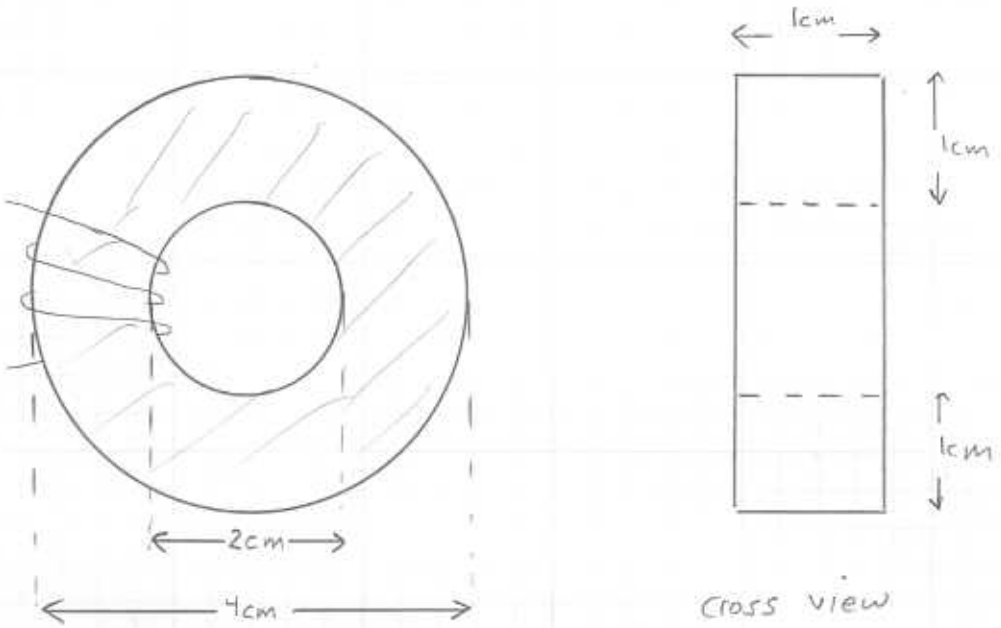
Problem 1 The following torroidal core is to be used to create an inductor. The material has $\mu_r = 4000$



(a) Determine the mean path around the core (in m)

(b) Determine the cross-sectional area (in m^2)

(c) Find the reluctance of the core

(d) How many turns must be wrapped around the torroid to achieve $L_{coil} \approx 40\,mH$ (choose integer turns that gives $L_{coil} \geq 40\,mH$)

(e) If we desire to keep the flux density in the core less than 0.5T, what is the maximum coil current?

(f) Estimate the length of wire required for the N turns