Doubling the number of wire turns in a coil. A coil with N turns of wire is wound uniformly and densely about a thin toroidal core made from a linear ferromagnetic material of relative permeability μ_r. Consider the magnetic flux density, B, inside the core and inductance, L, of the coil. If the diameter of the wire in the coil is halved and N is doubled, while the current I in the coil is kept the same, we have that

(A) both B and L double.
(B) both B and L remain the same.
(C) both B and L quadruple.
(D) B doubles and L quadruples.
(E) B remains the same and L quadruples.
(F) B remains the same and L is halved.

Solution: (D)
Answer: (D)