7. The primary difference between this and the situation described in Sample Problem 31-1 is in the quantity A. The area through which there is magnetic flux is not the area of the short coil, in this case, but is the area of the solenoid (there is no field outside an ideal solenoid). Actually, because of the current (which we calculate here) in the short coil, there is a very small amount of field outside the solenoid (caused by that current) – but it may be disregarded in this calculation. The values are as indicated in Sample Problem 31-1 except that $A = \pi D^2/4$ (where $D = 0.032$ m) and $N = 120$ for the short coil. Thus, we find $\Phi_{B,i} = 3.3 \times 10^{-5}$ Wb, and the magnitude of the induced emf is 0.16 V. Ohm's law then yields $0.16\,\mathrm{V}/5.3\,\Omega = 0.030$ A.