(a) What is maximum torque on coil?

\[ \tau = NIAB \sin \phi \]

\[ \tau_{\text{max}} = NIAB(1) \]

\[ \tau_{\text{max}} = (15)(2.7 A)(\pi)(8.6 \times 10^{-2} m)^2 (0.56 T) \]

\[ \tau_{\text{max}} = 13.2 \times 10^{-2} \text{ N.m} \]

(b) In what position is torque 71% \( \tau_{\text{max}} \)?

\[ \tau = NIAB \sin \phi \]

So when \( \sin \phi = 0.71 \) the \( \tau \) will be 71% of \( NIAB \) which is result of part (a) 0.132 N.m.

Thus \( \sin \phi = 0.71 \) implies that \( \phi = \sin^{-1}(0.71) = 45^\circ \)