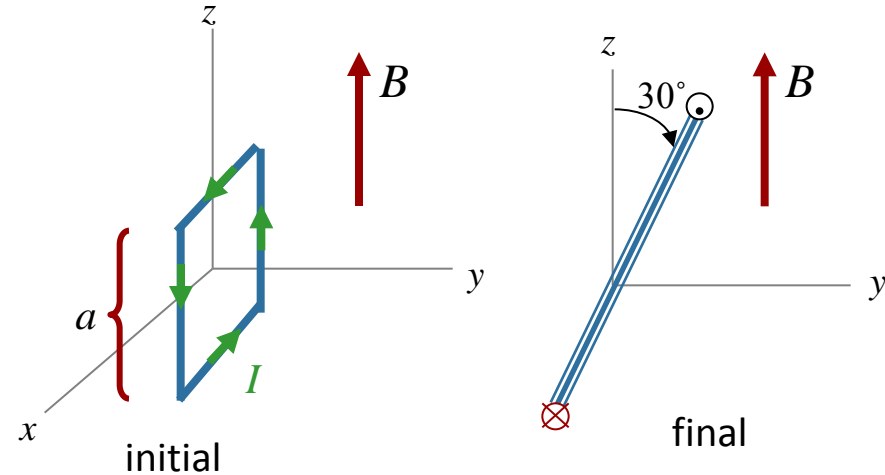# Calculation

A square loop of side **a** lies in the *x–z* plane with current I as shown. The loop can rotate about *x* axis without friction. A uniform field B points along the *+z* axis. Assume a, I, and B are known.
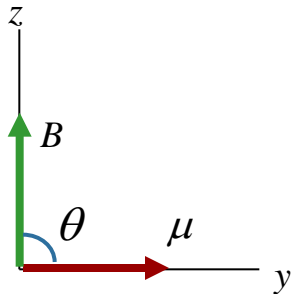
$$U = -\vec{\mu} \cdot \vec{B}$$

initial

final

What is the potential energy of the initial state?

A) $U_{initial} < 0$ B) $U_{initial} = 0$ C) $U_{initial} > 0$

$$\theta = 90^0 \quad \Longrightarrow \quad \vec{\mu} \bullet \vec{B} = 0$$