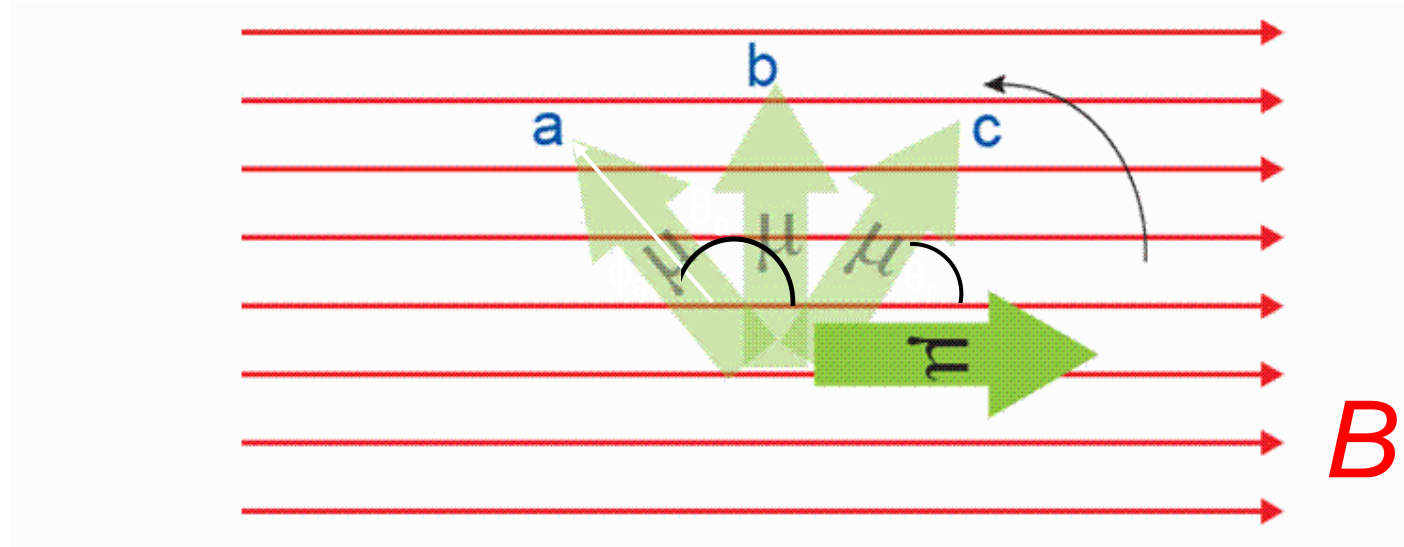




Three different orientations of a magnetic dipole moment in a constant magnetic field are shown below. We want to rotate the dipole in the CCW direction.



First, consider rotating to position c. What are the signs of the work done by you and the work done by the field?

- A) $W_{\text{you}} > 0, W_{\text{field}} > 0$
- B) $W_{\text{you}} > 0, W_{\text{field}} < 0$**
- C) $W_{\text{you}} < 0, W_{\text{field}} > 0$
- D) $W_{\text{you}} < 0, W_{\text{field}} < 0$

$$W_{\text{field}} = -\Delta U$$

- $\Delta U > 0$, so $W_{\text{field}} < 0$. W_{you} must be opposite W_{field}
- Also, torque and displacement in opposite directions \rightarrow
 $W_{\text{field}} < 0$