

# CheckPoint 2c

Three different orientations of a magnetic dipole moment in a constant magnetic field are shown below. In order to rotate a horizontal magnetic dipole to the three positions shown, which one requires the most work done by the magnetic field?

BY YOU    BY FIELD

a    b    c

$$W_{by\_field} = -\Delta U = U_i - U_f$$
$$U = -\vec{\mu} \cdot \vec{B}$$

C):  $\rightarrow W_{by\_field} = -\mu B - (-\mu B \cos \theta_c) = -\mu B(1 - \cos \theta_c)$

B):  $\rightarrow W_{by\_field} = -\mu B - 0 = -\mu B$

A):  $\rightarrow W_{by\_field} = -\mu B - (-\mu B \cos \theta_a) = -\mu B(1 + \cos \theta_a)$