Answer on Question #62811, Physics / Electromagnetism

a magnet is parallel to a uniform magnetic field. if it is rotated by 60 degrees,the work done is 0.8 J. how much additional work is done in moving it further through 30 degrees from that position?

Find: ΔA - ?

Given:

A_1=0.8 J

α_1=60°

α_2=90°

Solution:

$A \sim \sin\alpha$ (1)

Of (1) $\Rightarrow$ $A_1 \sim \sin\alpha_1$ (2)

$A_2 \sim \sin\alpha_2$ (3)

Of (2) and (3) $\Rightarrow$ $A_2 = \frac{\sin\alpha_2}{\sin\alpha_1} A_1$ (4)

Of (4) $\Rightarrow$ A_2=0.9238 J

$\Delta A = A_2 - A_1$ (5)

Of (5) $\Rightarrow$ ΔA=0.1238 J

Answer:

0.1238 J