

Warm Up Set 11

Question

1. The magnetic flux through each of five faces of a die is given by $\Phi_B = \pm N$ Wb, where N (=1 to 5) is the number of spots on the face. The flux is positive (outward) for N even and negative (inward) for N odd. What is the flux through the sixth face of the die?

Answer

Total magnetic flux through an closed surface is 0. Thus, the flux through all the individual sides of this cube must sum to 0.

$$\begin{aligned} -1\text{Wb} + 2\text{Wb} - 3\text{Wb} + 4\text{Wb} - 5\text{Wb} + x &= 0 \\ -3\text{Wb} + x &= 0 \\ x &= 3\text{Wb} \end{aligned}$$