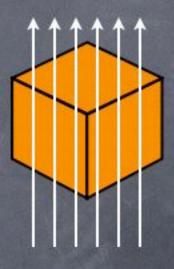# Question

Imagine a cube of side a positioned in a region of constant electric field, strength E, as shown.
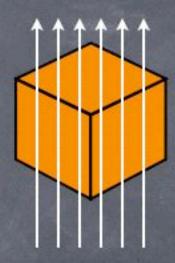
Which of the following statements about the net electric flux Φ through the surface of this cube is true?

(a) $\Phi = 0$ (b) $\Phi = 2Ea^2$ (c) $\Phi = 6Ea^2$

Answer

Which of the following statements about the net electric flux Φ through the surface of this cube is true?

(a) $\Phi = 0$ (b) $\Phi = 2Ea^2$ (c) $\Phi = 6Ea^2$

1. The integral $\int_S \vec{E} \cdot d\vec{A} = 0$ on the four sides that are parallel to electric field

2. $\int_S \vec{E} \cdot d\vec{A}$ on bottom face is negative $d\vec{A}$ is out; $\vec{E}$ is "in"

3. $\int_S \vec{E} \cdot d\vec{A}$ on top face is positive $d\vec{A}$ is out; $\vec{E}$ is "out"