

Answer on question #65023, Physics / Other

Question Surge is a student at the Xavier Institute, because she is a mutant whose power is to absorb all nearby electricity. She is captured by the Purifiers and placed at the exact center of a cubic cage. If the electric flux through any single side of the cube is equal to $5.2 \cdot 10^7 \text{ N m}^2/\text{C}$, what is the net charge on Surge?

Solution Here we will use Gauss theorem to find the net charge. This theorem tells us that net charge is equal to flux multiplied by total area

$$Q = F \cdot S = 5.2 \cdot 10^7 \cdot 6 \cdot a^2 = 31.2 \cdot 10^7 a^2 \text{ C}$$

where a is length of edge of the cage in meters.