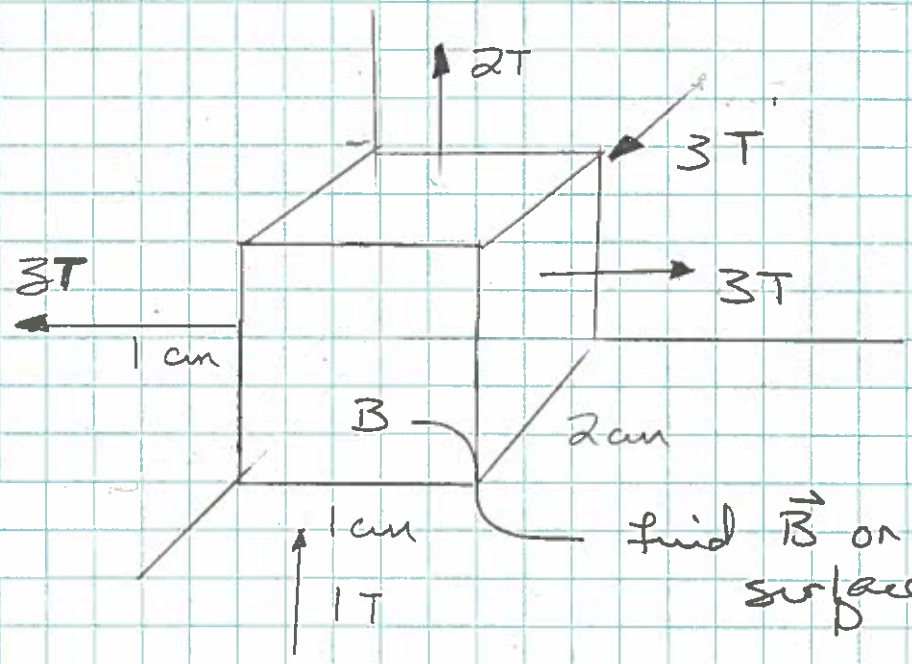

For the closed surface of the cube:

$$\oint \vec{B} \cdot d\vec{A} = \sum_{i=1}^{6} B_i A_i = 0$$

Gauss' Law for $\vec{B}$ (+ out and − in)

$$(3T)(2\times10^{-4}m^2) + B(10^{-4}m^2) - (1T)(2\times10^{-4}m^2)$$
$$+ (3T)(2\times10^{-4}m^2) + (2T)(2\times10^{-4}m^2)$$
$$- (3T)(10^{-4}m^2) = 0$$

$$B(10^{-4}m^2) + .11\times10^{-4} = 0$$

$\underline{B = -11\ T}$ which means

B goes into the face.