Problem 24.9

The charges listed below are all found inside a submarine.

a.) What is the net *electric flux* through the submarine due to the charges?

$$\Phi_E = \frac{q_{enclosed}}{\varepsilon_o}$$

$$= \frac{\left(5 \times 10^{-6}\,C\right) + \left(-9 \times 10^{-6}\,C\right) + \left(27 \times 10^{-6}\,C\right) + \left(-84 \times 10^{-6}\,C\right)}{8.85 \times 10^{-12}\,C^2 / N \bullet m^2}$$

$$= -6.9 \times 10^6 \ N \bullet m^2 / C$$

b.) Are more *electric field lines* passing *into* or *out of* the submarine.

Because the net flux is negative, there must be more field lines passing *into* the submarine than *out of* the submarine.