

Physics 102-Rec
Quiz # 6
Chapter 24

Date: 30 April 2002

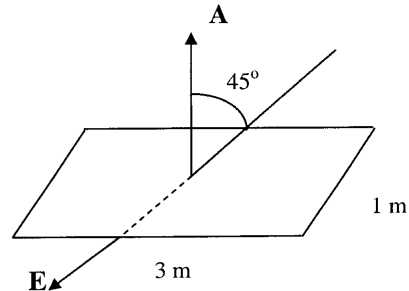
Name: Key Id: _____ Sect: _____

1. Calculate the net electric flux through the surface shown in the figure if the electric field has a magnitude of 3000 N/C.

$$\Phi = \vec{E} \cdot \vec{A} = EA \cos \theta$$

$$\Phi = 3000 \times 3 \times \cos 135$$

$$\Phi = -6364 \frac{\text{N} \cdot \text{m}^2}{\text{C}}$$



2. Consider two very thin and parallel non-conducting sheets carrying charge densities of $5.0 \mu\text{C}/\text{m}^2$ and $-5 \mu\text{C}/\text{m}^2$.

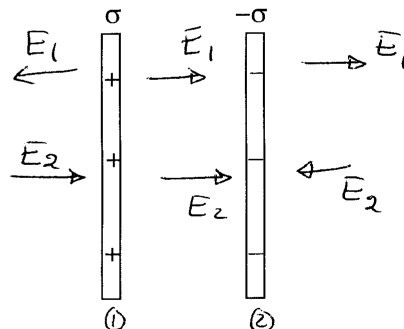
Determine the electric field

(a) on the left of the positively charged plate.

$$E_1 = \frac{\sigma}{2\epsilon_0} \text{ and } E_2 = \frac{\sigma}{2\epsilon_0}$$

$$\Rightarrow E_{\text{net}} = \frac{\sigma}{2\epsilon_0} - \frac{\sigma}{2\epsilon_0} = 0$$

$$E_{\text{net}} = 0$$



(b) between the plates

$$E_{\text{net}} = \frac{\sigma}{2\epsilon_0} + \frac{\sigma}{2\epsilon_0} = \frac{\sigma}{\epsilon_0} \Rightarrow E_{\text{net}} = \frac{\sigma}{\epsilon_0}$$

(c) on the right of the negatively charged plate.

$$E_{\text{net}} = \frac{\sigma}{2\epsilon_0} - \frac{\sigma}{2\epsilon_0} = 0 \Rightarrow E_{\text{net}} = 0$$