Special Problem 9-2.2

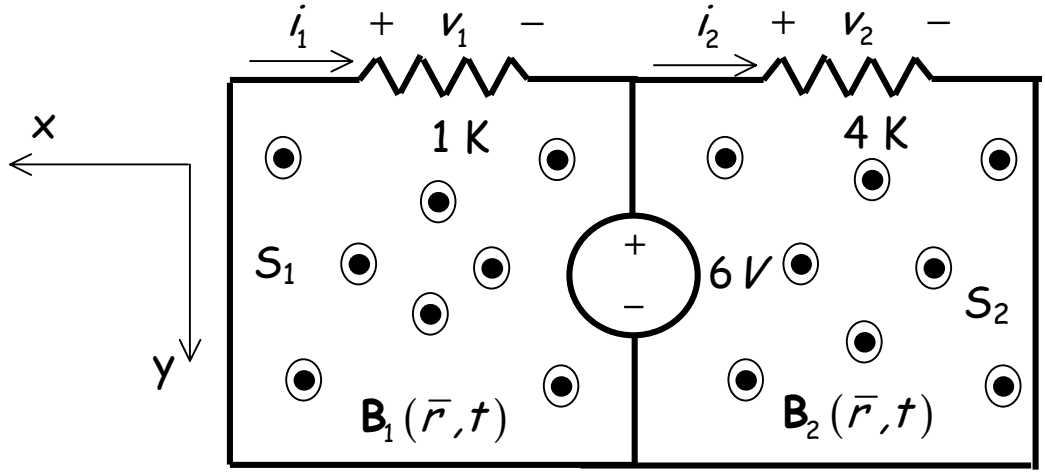
The circuit below forms **two** surfaces. The surface on the **left** is a square denoted as S_1. The surface on the **right** is a square denoted as S_2. The surface area of each surface is **2 m^2** .

The **magnetic flux density** on surface $\mathbf{S_1}$ is:

$$\mathbf{B}_1(\bar{r},t) = 5t\,\hat{a}_z \qquad \left[\frac{\mathrm{W}}{\mathrm{m}^2}\right]$$

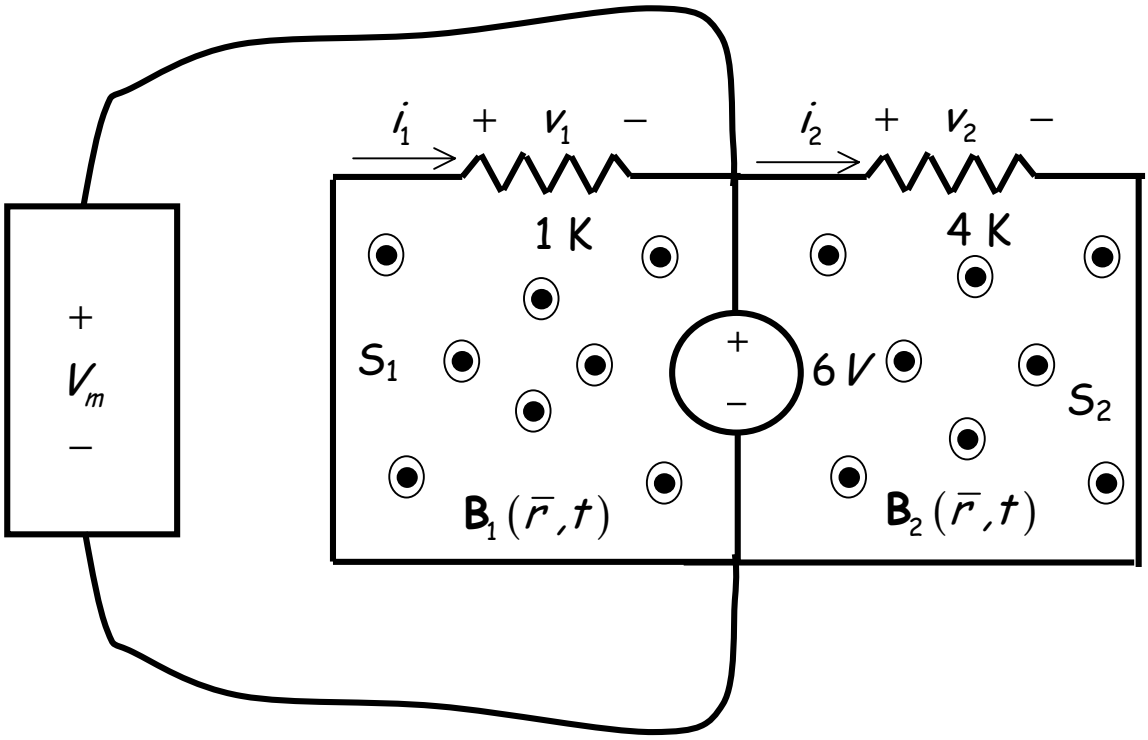
while the magnetic flux density on surface $\mathbf{S_2}$ is

$$\mathbf{B}_2(\bar{r},t) = t\,\hat{a}_z \qquad \left[\frac{\mathrm{W}}{\mathrm{m}^2}\right]$$



1) Determine the **voltages** v_1 and v_2 and **currents** i_1 and i_2.

2) Determine the voltage V_m that a **voltage meter** would read in the following situation:


i_1
+
v_1
−
i_2
+
v_2
−
1 K
4 K
+
V_m
−
S_1
+
−
6 V
S_2
$\mathbf{B}_1(\bar{r},t)$
$\mathbf{B}_2(\bar{r},t)$