

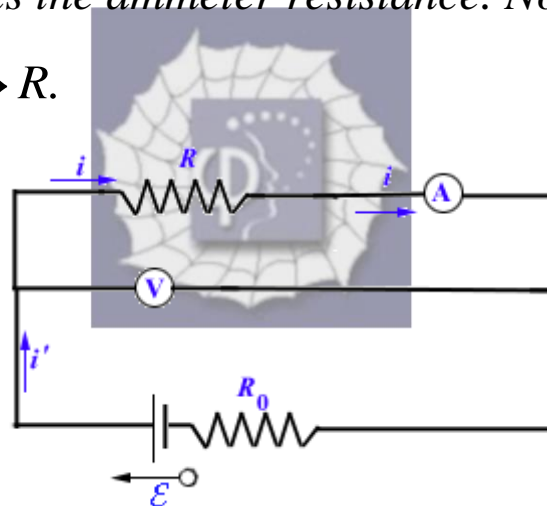
419.

Problem 33.44 (RHK)

Resistance can also be measured by using circuit shown in the figure. If the meter reading of the ammeter is i and that of the voltmeter is V , then the ratio V/i gives the apparent resistance R' related to R by

$$R = R' - R_A,$$

in which R_A is the ammeter resistance. Note that as $R_A \rightarrow 0$, $R' \rightarrow R$.



Solution:

From Ohm's law, we note that

$$i(R + R_A) = V.$$

But the apparent resistance is defined by

$$\frac{V}{i} = R'.$$

Therefore, $R = R' - R_A$, and as $R_A \rightarrow 0$, $R' \rightarrow R$.

