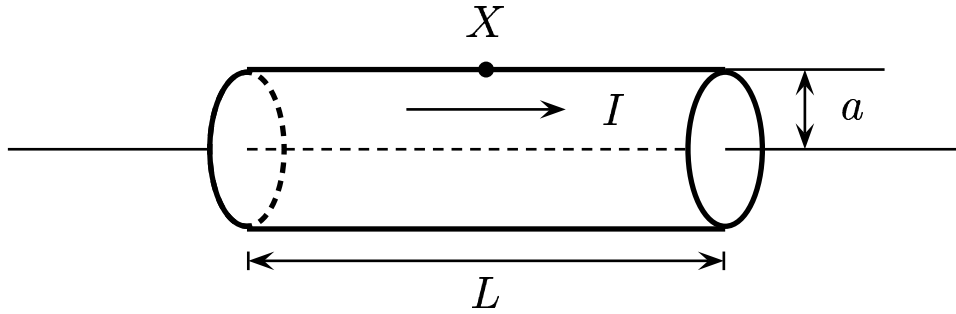


A straight long wire of resistance R , radius a and length L . It carries a constant current I .



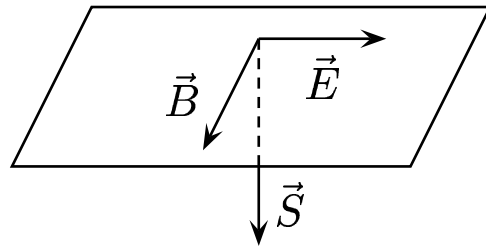
Determine the direction of the Poynting vector \vec{S} at X .

- A) The direction of \vec{S} is \leftarrow .
- B) The direction of \vec{S} is \uparrow .
- C) The direction of \vec{S} is \rightarrow .
- D) The direction of \vec{S} is \downarrow .

\vec{E} is along the direction of I . At X , using the right-hand-rule, one finds

that \vec{B} is pointing out of the paper. Thus $\vec{S} = \frac{1}{\mu_0} \vec{E} \times \vec{B}$, and it is pointing

downward, or pointing radially inward.



Answer **D**.

34.04-02 Poynting Vector at a Conducting Surface 2004-11-9