

PROBLEM SET 5
ECE 311 Autumn Quarter 2008

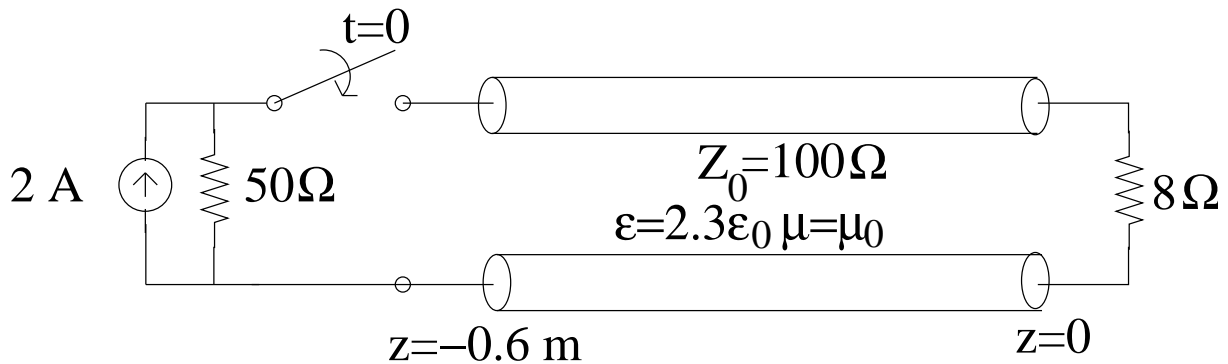
Assigned: October 29th
Due: November 5th in class

Instructor: Joel Johnson

Problem 1

For the circuit shown below,

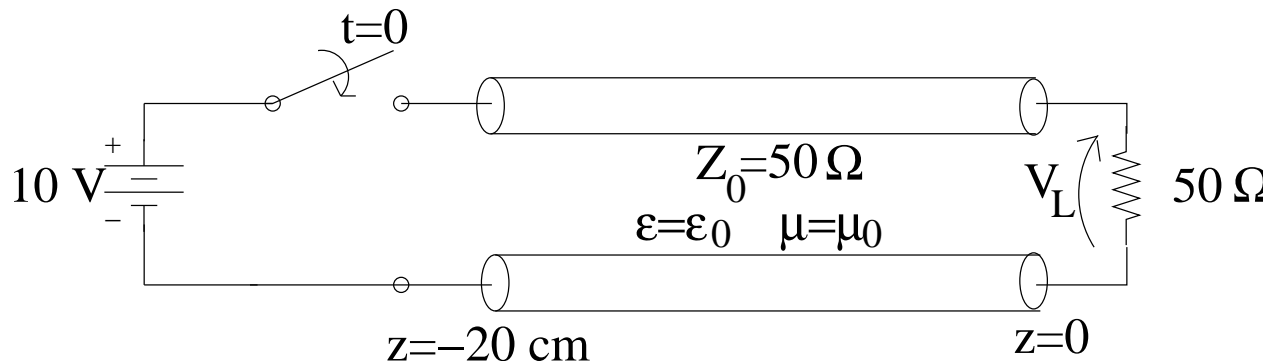
- (a) Sketch and dimension $v(z, t)$ at $t = 2$ nsecs.
- (b) Sketch and dimension $i(z, t)$ at $t = 4$ nsecs.
- (c) Sketch and dimension $v(z, t)$ at $t = 8$ nsecs.
- (d) Find the voltage across the load as $t \rightarrow \infty$.



Problem 2

For the circuit shown below,

- (a) Sketch and dimension $i(z, t)$ at $t = 0.5$ nsecs.
- (b) Sketch and dimension $v(z, t)$ at $t = 1$ nsecs.
- (c) Sketch and dimension $i(z, t)$ at $t = 1.5$ nsecs.
- (d) Discuss how the transient response of this circuit is different from that in Problem 1.



Problem 3

Given two vectors, $\vec{A} = -\hat{x} + 21\hat{y} + 3\hat{z}$ and $\vec{B} = 9\hat{x} - 2\hat{y} - 2\hat{z}$, find

- (a) a unit vector in the direction of $\vec{A} + 2\vec{B}$
- (b) $|\vec{A} + \vec{B}|$
- (c) $|\vec{A}| + |\vec{B}|$. Compare to part (b).
- (d) $\vec{A} \times \vec{B}$
- (e) the angle between \vec{A} and \vec{B}
- (f) Find a constant α so that $\vec{B} + \alpha\vec{A}$ is perpendicular to \vec{A}