Web**Assign**
CH24-HW01-FALL2010 (Homework)

Yinglai Wang
PHYS 272-FALL 2012, Fall 2012
Instructor: Virendra Saxena

Current Score : 10 / 10   **Due :** Tuesday, December 4 2012 11:59 PM EST

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1. 2/2 points | Previous Answers   MI3 24.2.X.024

At a time t_0 an electric field is detected in the region shown on the left diagram. The electric field is zero at all other locations. At a later time t_1 an electric field is detected in the region shown on the right diagram; the electric field is zero elsewhere.
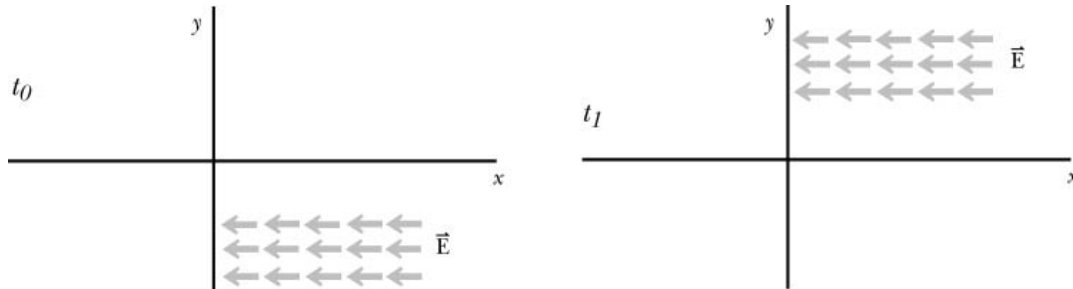
You conclude that an electromagnetic wave is passing through the region.
(a) What is the direction of propagation of the electromagnetic wave?

| +y   ⬍ | ✔

(b) If you were to measure the magnetic field in the region where the electric field is nonzero, what would be the direction of the magnetic field?

| +z (out of page) ⬍ | ✔

- *Read the eBook*
- Section 24.2

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2. 2/2 points | Previous Answers   MI3 24.2.X.025

A pulse of electromagnetic radiation is propagating in the -y direction. You have two devices that can detect electric and magnetic fields. You place detector #1 at location < 0, 4, 0> m and detector #2 at location < 0, -4, 0> m.

(a) At time $t = 0$, detector #1 detects an electric field in the -x direction. At that instant, what is the direction of the magnetic field at the location of detector #1?

| -z   ⬍ | ✔

(b) At what time will detector #2 detect electric and magnetic fields?
$t =$ | 2.667e-8 | ✔   s

- *Read the eBook*
- Section 24.2

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3. 1/1 points | Previous Answers   MI3 24.2.X.001

If the magnetic field in a particular pulse has a magnitude of 3×10^{-5} tesla (comparable to the Earth's magnetic field), what is the magnitude of the associated electric field?

`9000` ✔ V/m

- *Read the eBook*
- Section 24.2

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4. 3/3 points | Previous Answers   MI3 24.2.X.026

A pulse of radiation propagates with velocity $\vec{v} = < 0, 0, -c >$. The electric field in the pulse is $\vec{E} = <$ $3.8 \times 10^{6}, 0, 0 >$ N/C. What is the magnetic field in the pulse?

< `0` ✔ , `-1.267e-2` ✔ , `0` ✔ > T

- *Read the eBook*
- Section 24.2

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5. 2/2 points | Previous Answers   MI3 24.2.X.023
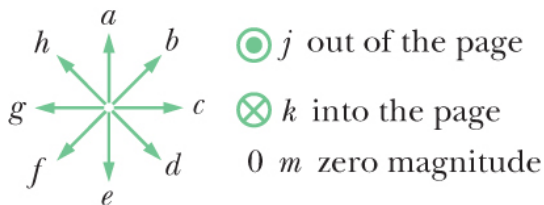
Electromagnetic radiation is moving to the right, and at this time and place the electric field is horizontal and points out of the page (see the figure). The magnitude of the electric field is $E = 2700$ N/C.

What is the magnitude of the associated magnetic field at this time and place?

$B =$ `9e-6` ✔ T

What is the direction of the associated magnetic field at this time and place? `e` ⇕ ✔

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