WebAssign
CH18-HW01-FALL2010 (Homework)

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

Current Score : 27.5 / 27.5 **Due :** Tuesday, October 2 2012 11:59 PM EDT

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1. 0.5/0.5 points | Previous Answers MI3 18.3.X.028

The vectors $\vec{a}$ and $\vec{b}$ both lie in the *yz* plane. The vector $\vec{c}$ is equal to $\vec{a}\times\vec{b}$. Which of these statements about $\vec{c}$ must be true?

- ○ The *x* and *y* components of $\vec{c}$ are zero
- ◉ The *y* and *z* components of $\vec{c}$ are zero
- ○ The *z* and *x* components of $\vec{c}$ are zero

- *Read the eBook*
- Section 18.3

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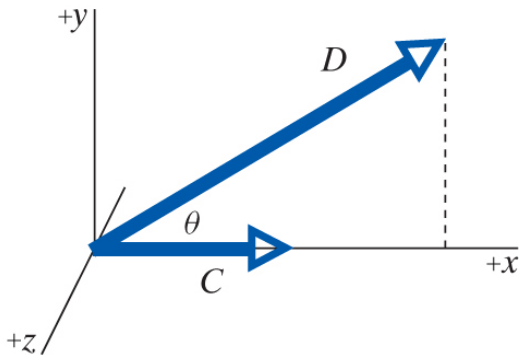
2. 3/3 points | Previous Answers MI3 18.3.X.026

(a) A vector $\vec{C}$ of magnitude 2 lies along the *x* axis, and a vector $\vec{D}$ of magnitude 6 lies in the *xy* plane, 80 degrees from the *x* axis (see the figure).



(b) What is the magnitude and direction of the cross product $\vec{C}\times\vec{D}$?

magnitude

$|\vec{C}\times\vec{D}|$ = 11.818

direction (Select all that apply. If the vector lies at the intersection of two planes, be sure to indicate which planes.)

- [ ] -y
- [ ] +y
- [ ] -x
- [x] in the *yz* plane
- [ ] in the *xy* plane
- [x] +z
- [ ] +x
- [ ] -z
- [x] in the *xz* plane

What is the cross product $\vec{D} \times \vec{C}$?

$\vec{D} \times \vec{C}$ =

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(c) Draw both vectors on a diagram. (Do this on paper. Your instructor may ask you to turn in this work.)

- *Read the eBook*
- Section 18.3

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3. 3/3 points | Previous Answers MI3 18.3.X.029

What is < 8, 0, -3 > × < -6, 3, 3 >?

< 9 , -6 , 24 >

- *Read the eBook*
- Section 18.3

4. 3/3 points | Previous Answers MI3 18.3.X.027

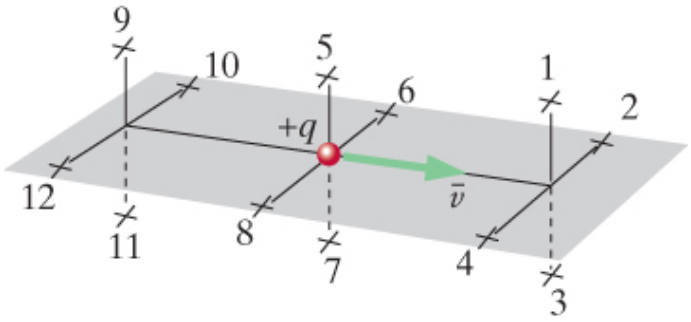
If $\vec{v}$ = < 477, -456, 372 > m/s and $\hat{r}$ = < 0.577, 0.577, -0.577 > what is $\vec{v} \times \hat{r}$?

$\vec{v} \times \hat{r}$ = < 48.468 , 489.873 , 538.341 >

- *Read the eBook*
- Section 18.3

5. 3/3 points | Previous Answers MI3 18.3.X.004

A positively charged particle moves in the +x direction, as shown below. Locations 1, 5, and 9 are above the xz plane, directly above the x axis. Locations 3, 7, and 11 are below the xz plane, directly below the x axis.



What is the direction of the magnetic field due to this particle at location 2?

+y direction

What is the direction of the magnetic field due to this particle at location 3?

-z direction

What is the direction of the magnetic field due to this particle at location 4?

-y direction

- *Read the eBook*
- Section 18.3

6. 9/9 points | Previous Answers MI3 18.3.X.036

At a particular instant, a proton at the origin has velocity < 5e4, -4e4,0> m/s. You need to calculate the magnetic field at location < 0.02, 0.05, 0 > m, due to the moving proton.

What is the vector $\vec{r}$?

$\vec{r}$ = < 0.02 ✓ , 0.05 ✓ , 0 ✓ >m

What is the unit vector $\hat{r}$?

$\hat{r}$ = < 0.3714 ✓ , 0.9285 ✓ , 0 ✓ >

What is $\vec{v} \times \hat{r}$?

$\vec{v} \times \hat{r}$ = < 0 ✓ , 0 ✓ , 61281 ✓ > m/s

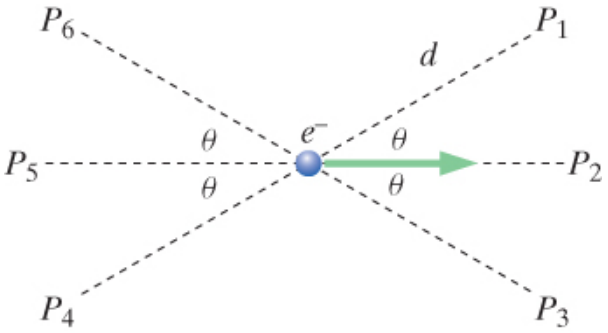
What is the magnetic field at the observation location, due to the moving proton?

$\vec{B}$ = < 0 ✓ , 0 ✓ , 3.38e-19 ✓ >T

- *Read the eBook*
- Section 18.3

7. 6/6 points | Previous Answers MI3 18.3.X.034

An electron is moving horizontally to the right with speed 5×10^6 m/s. What is the magnetic field due to this moving electron at the indicated locations in the figure? Each location is d = 6 cm from the electron, and the angle θ = 32°. Give both magnitude and direction of the magnetic field at each location.



P_1 = 1.18e-17 T into the page

P_2 = 0 T no magnetic field

P_3 = 1.18e-17 T out of the page

P_4 = 1.18e-17 T out of the page

P_5 = 0 T no magnetic field

P_6 = 1.18e-17 T into the page

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