Question 1

Let $\hat{\mathrm{i}}$ denote a unit vector along the x axis, $\hat{\mathrm{j}}$ a unit vector along the y axis, and $\hat{\mathrm{k}}$ denote a unit vector along the z axis. Suppose that

$$\vec{\mathrm{A}} = 3\hat{\mathrm{k}}$$
$$\vec{\mathrm{B}} = 2\hat{\mathrm{j}}$$

Which of the following is true?

1. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 0.$
2. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 6\hat{\mathrm{k}}.$
3. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 6\hat{\mathrm{k}} + 6\hat{\mathrm{j}}.$
4. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 6\hat{\mathrm{i}}.$
5. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = -6\hat{\mathrm{i}}.$

Question 2

Let $\hat{\mathrm{i}}$ denote a unit vector along the x axis, $\hat{\mathrm{j}}$ a unit vector along the y axis, and $\hat{\mathrm{k}}$ denote a unit vector along the z axis. Suppose that

$$\vec{\mathrm{A}} = 2\hat{\mathrm{i}} + 4\hat{\mathrm{j}}$$

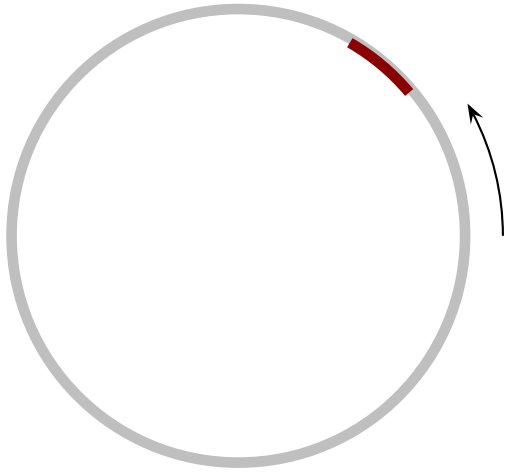
$$\vec{\mathrm{B}} = 10\hat{\mathrm{i}}$$

Which of the following is true?

1. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 0.$
2. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 20\hat{\mathrm{i}}.$
3. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 40\hat{\mathrm{k}}.$
4. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = -40\hat{\mathrm{k}}.$
5. $\vec{\mathrm{A}} \times \vec{\mathrm{B}} = 20\hat{\mathrm{i}} + 40\hat{\mathrm{j}}.$

Question 3

A circular loop carries current as illustrated. Consider the field that it produces at the center of the loop. Consider the contribution to the field from the shaded section.

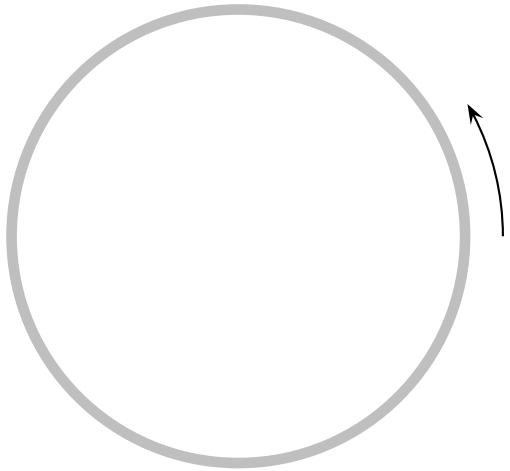


Which way does the field contribution from this section point?

1. Into the board.
2. Out of the board.
3. Clockwise.
4. Counterclockwise.
5. 
6. 

Question 4

A circular loop carries current as illustrated. Consider the field that it produces at the center of the loop.



Which way does the net field from the entire loop point?

1. Into the board.
2. Out of the board.
3. Clockwise.
4. Counterclockwise.
5. Field is zero.