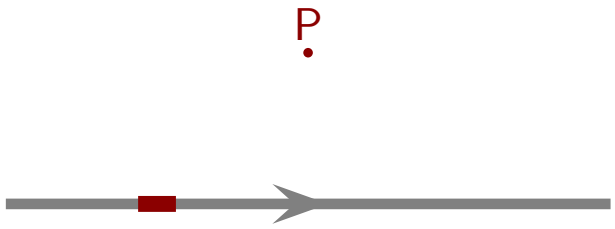
Question 1

A straight section of wire carries the illustrated current.



Which of the following are the vectors used in the Biot-Savart Law to determine the magnetic field produced by the shaded section at P?

1. $\Delta\vec{s} = \rightarrow$ and $\vec{r} = \uparrow$.
2. $\Delta\vec{s} = \rightarrow$ and $\vec{r} = \nearrow$.
3. $\Delta\vec{s} = \rightarrow$ and $\vec{r} = \swarrow$.
4. $\Delta\vec{s} = \leftarrow$ and $\vec{r} = \uparrow$.
5. $\Delta\vec{s} = \leftarrow$ and $\vec{r} = \nearrow$.
6. $\Delta\vec{s} = \leftarrow$ and $\vec{r} = \swarrow$.

Warm Up Question 1

Consider a finite section of current in a wire that lies on the page/screen and runs upwards. We aim to determine the field at some point to the right of the bottom of the wire by breaking the current into many small segments along the wire. Consider the contributions to the field from the two segments, one at the bottom and the other at the top of the wire. Will the directions of these field contributions be the same? Will the magnitudes be the same? Explain your answer.

1. Magnitudes same. Directions same.
2. Magnitudes same. Directions different.
3. Magnitudes different. Directions same.
4. Magnitudes different. Directions different.

Question 2

A straight section of wire carries the illustrated current.

Which of the following does the Biot-Savart Law predict for the magnetic field at P?

1. $\vec{\mathrm{B}} = 0$
2. $\vec{\mathrm{B}} \neq 0$ into page/screen
3. $\vec{\mathrm{B}} \neq 0$ out of page/screen
4. $\vec{\mathrm{B}} \neq 0$ with direction $\rightarrow$
5. $\vec{\mathrm{B}} \neq 0$ with direction $\downarrow$

Warm Up Question 2

An infinitely long straight wire carries a constant current and produces a magnetic field of 1T at a distance of 1cm from the wire. Which of the following gives the approximate current needed to produce this?

1. 50 A
2. 500 A
3. 5000 A
4. 50000 A
5. 500000 A