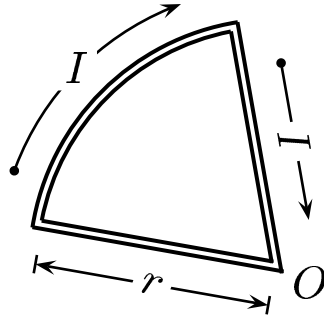


A current loop consists of one circular arc subtended by an angle α , and two radial segments. There is a clockwise current I and the radius is r .



The direction of the magnetic field at the center O

- A) is into the paper.
- B) is out of the paper.
- C) cannot be determined since $B = \infty$.
- D) cannot be determined since $B = 0$.

Based on the Biot-Savart law, $\delta\vec{B} = \frac{\mu}{4\pi} \frac{\vec{r} \times i \delta\vec{L}}{r^3}$. Taking the cross product, one finds that for any current segment along the circle, the corresponding $\delta\vec{B}$ at the center always points into the paper and the currents along the two radial segments do not contribute to the magnetic field at the center.

So \vec{B} due to the entire current loop should also point into the paper.

Answer **A**.