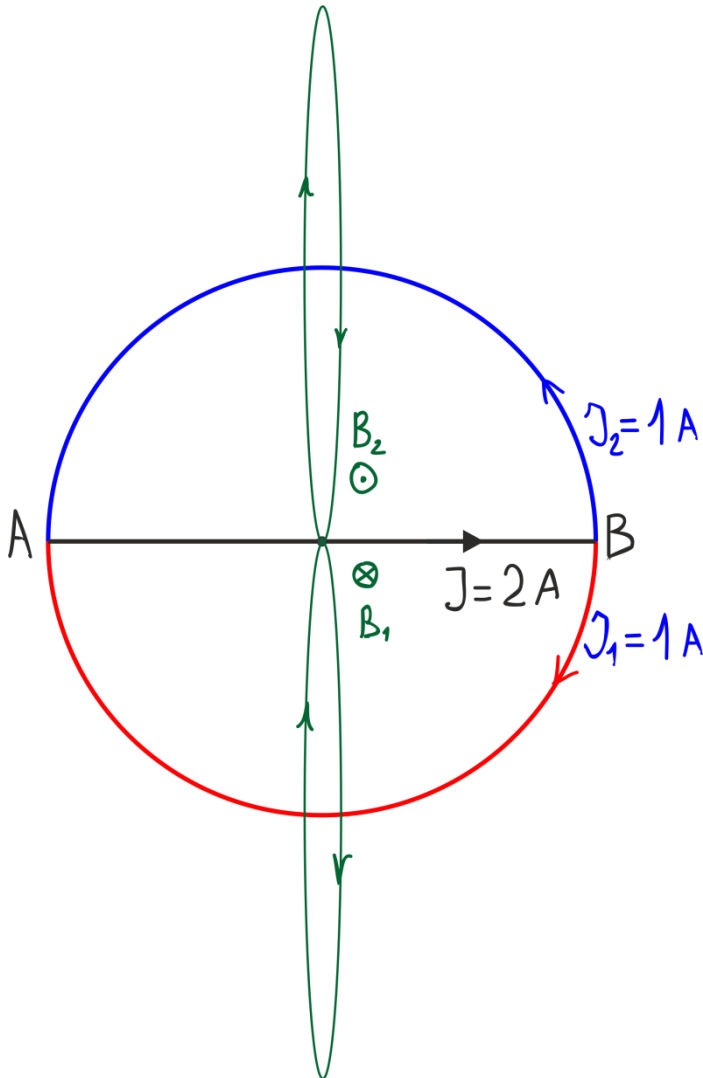# Answer on Question #82219 Physics / Electromagnetism

2A current is passed along the diameter AB of a circular loop. Find the magnetic field at the center O of the loop. Radius of the loop is 2cm.

Solution:

We have two semi-circulars. The magnetic field at the center first semi-circular

$$B_1 = \frac{\mu_0 I_1}{4r}$$

The magnetic field at the center second semi-circular

$$B_2 = \frac{\mu_0 I_2}{4r}$$

Since $I_1 = I_2 = 1$ A, we get

$$B_1 = B_2$$

The superposition principle states

$$\boldsymbol{B} = \boldsymbol{B}_1 + \boldsymbol{B}_2$$

Because the magnetic fields from two semi-circulars have opposite direction, we obtain $B = B_1 - B_2 = 0$

For further studying please see

https://en.wikipedia.org/wiki/Biot–Savart_law

http://hyperphysics.phy-astr.gsu.edu/hbase/magnetic/curloo.html#c1

Answer: $B = 0$

Answer provided by https://www.assignmentexpert.com