PHYS 212 Ch-29: Biot-Savart Law Practice for Test

 A current-length element *i* produces a differential magnetic field at point *P,* directed *into* the page there. Its value is given by Biot-Savart law as follows:





Show that the magnetic field at *C* due to a circular arc of wire is given by the following equation.





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| 1. (P8)    | In Fig. [29-39](http://edugen.wiley.com/edugen/courses/crs4957/halliday9118/halliday9088c29/halliday9118/halliday9088c29/halliday9088c29xlinks.xform?id=halliday9088c29-fig-0039), two semicircular arcs have radii *R*2 = 7.80 cm and *R*1 = 3.15 cm, carry current *i* = 0.281 A, and share the same center of curvature *C*. What are the (a) magnitude and (b) direction (into or out of the page) of the net magnetic field at *C*? |


2. (P 64) In Fig. [29-76](http://edugen.wiley.com/edugen/courses/crs4957/halliday9118/halliday9088c29/halliday9118/halliday9088c29/halliday9088c29xlinks.xform?id=halliday9088c29-fig-0076), a closed loop carries current *i* = 200 mA. The loop consists of two radial straight wires and two concentric circular arcs of radii 2.00 m and 4.00 m. The angle *θ* is *π*/4 rad. What are the (a) magnitude and (b) direction (into or out of the page) of the net magnetic field at the center of curvature *P*?

