d_cp2.12

The LaTex code that creates this quiz is released to the Public Domain
Attribution for each question is documented in the Appendix

Wednesday 24th October, 2018

Latex markup at
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Contents

1 Quiz

1. A wire carries a current of 200 A in a circular arc with radius 2 cm swept through 40 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?[1]

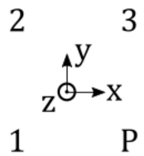
    A. 2.083E+00 Tesla

    B. 2.292E+00 Tesla

    C. 2.521E+00 Tesla

    D. 2.773E+00 Tesla

    E. 3.050E+00 Tesla

2. 

Three wires sit at the corners of a square of length 1 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.9 A, 2.0 A, 2.1 A), respectively. What is the x-component of the magnetic field at point P?[2]

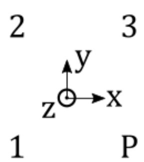
    A. B_x= 5.124E-05 T

    B. B_x= 5.636E-05 T

    C. B_x= 6.200E-05 T

    D. B_x= 6.820E-05 T

    E. B_x= 7.502E-05 T

3. 

Three wires sit at the corners of a square of length 1 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.9 A, 2.0 A, 2.1 A), respectively. What is the y-component of the magnetic field at point P?[3]

    A. B_y= 5.273E-05 T

    B. B_y= 5.800E-05 T

    C. B_y= 6.380E-05 T

    D. B_y= 7.018E-05 T

    E. B_y= 7.720E-05 T

4. Two parallel wires each carry a 5.0 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.0 cm, 0.9 cm), while the other is located at (0.000E+00 cm, 4.0 cm). What is the force per unit length between the wires?[4]

    A. 7.916E-11 N/m

    B. 8.708E-11 N/m

    C. 9.579E-11 N/m

    D. 1.054E-10 N/m

    E. 1.159E-10 N/m

5. Two loops of wire carry the same current of 10 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.5 m while the other has a radius of 1.0 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.25 m from the first (smaller) loopif the disance between the loops is 1.0 m?[5]

A. 1.110E-02 T

B. 1.221E-02 T

C. 1.343E-02 T

D. 1.477E-02 T

E. 1.625E-02 T

6. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 0.8 mm from the center of a wire of radius 2 mm if the current is 1A?[6]

A. 2.732E-05 T

B. 3.005E-05 T

C. 3.306E-05 T

D. 3.636E-05 T

E. 4.000E-05 T

7. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.5$ m and $B_{max} = 0.3$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.25$ m that is centered on the axis with its plane perpendicular to the axis?[7]

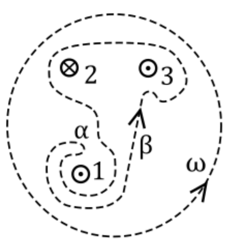
A. 2.812E+05 A

B. 3.094E+05 A

C. 3.403E+05 A

D. 3.743E+05 A

E. 4.118E+05 A



8. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.5 kA, I_2=0.75 kA, and I_3=1.5 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:[8]

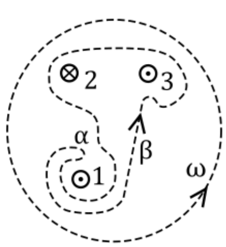
A. 6.437E-04 T-m

B. 7.081E-04 T-m

C. 7.789E-04 T-m

D. 8.568E-04 T-m

E. 9.425E-04 T-m



9. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.5 kA, I_2=0.75 kA, and I_3=1.5 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:[9]

A. 3.713E-03 T-m

B. 4.084E-03 T-m

C. 4.492E-03 T-m

D. 4.942E-03 T-m

E. 5.436E-03 T-m

10. A solenoid has 3.000E+04 turns wound around a cylinder of diameter 1.2 cm and length 14 m. The current through the coils is 0.41 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2 cm to z=+8 cm [10]

A. 7.541E-05 T-m

B. 8.295E-05 T-m

C. 9.124E-05 T-m

D. 1.004E-04 T-m

E. 1.104E-04 T-m

11. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 20 turns per centimeter and the current applied to the solenoid is 200 mA, the net magnetic field is measured to be 1.4 T. What is the magnetic susceptibility for this case?[11]

A. χ (chi) = 2.301E+03

B. χ (chi) = 2.531E+03

C. χ (chi) = 2.784E+03

D. χ (chi) = 3.063E+03

E. χ (chi) = 3.369E+03

2 Renditions

2.1

1. A wire carries a current of 316 A in a circular arc with radius 1.55 cm swept through 76 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - A. 8.070E+00 Tesla
   - **B. 8.878E+00 Tesla**
   - C. 9.765E+00 Tesla
   - D. 1.074E+01 Tesla
   - E. 1.182E+01 Tesla

2. A wire carries a current of 303 A in a circular arc with radius 2.2 cm swept through 72 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - A. 3.881E+00 Tesla
   - B. 4.269E+00 Tesla
   - C. 4.696E+00 Tesla
   - D. 5.165E+00 Tesla
   - **E. 5.682E+00 Tesla**

3. A wire carries a current of 306 A in a circular arc with radius 2.04 cm swept through 55 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - A. 3.551E+00 Tesla
   - B. 3.907E+00 Tesla
   - C. 4.297E+00 Tesla
   - **D. 4.727E+00 Tesla**
   - E. 5.200E+00 Tesla

4. A wire carries a current of 109 A in a circular arc with radius 1.26 cm swept through 71 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - A. 2.908E+00 Tesla
   - B. 3.199E+00 Tesla
   - **C. 3.519E+00 Tesla**
   - D. 3.871E+00 Tesla
   - E. 4.258E+00 Tesla

5. A wire carries a current of 266 A in a circular arc with radius 2.21 cm swept through 73 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - **A. 5.034E+00 Tesla**
   - B. 5.538E+00 Tesla
   - C. 6.091E+00 Tesla
   - D. 6.701E+00 Tesla
   - E. 7.371E+00 Tesla

6. A wire carries a current of 202 A in a circular arc with radius 2.17 cm swept through 51 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?
   - A. 2.473E+00 Tesla

B. 2.720E+00 Tesla

C. 2.992E+00 Tesla

D. 3.291E+00 Tesla

E. 3.620E+00 Tesla

7. A wire carries a current of 106 A in a circular arc with radius 1.32 cm swept through 38 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 1.589E+00 Tesla

B. 1.748E+00 Tesla

C. 1.923E+00 Tesla

D. 2.116E+00 Tesla

E. 2.327E+00 Tesla

8. A wire carries a current of 193 A in a circular arc with radius 3.13 cm swept through 40 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 1.285E+00 Tesla

B. 1.413E+00 Tesla

C. 1.554E+00 Tesla

D. 1.710E+00 Tesla

E. 1.881E+00 Tesla

9. A wire carries a current of 385 A in a circular arc with radius 1.53 cm swept through 58 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 5.711E+00 Tesla

B. 6.283E+00 Tesla

C. 6.911E+00 Tesla

D. 7.602E+00 Tesla

E. 8.362E+00 Tesla

10. A wire carries a current of 353 A in a circular arc with radius 2.44 cm swept through 86 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 5.891E+00 Tesla

B. 6.481E+00 Tesla

C. 7.129E+00 Tesla

D. 7.841E+00 Tesla

E. 8.626E+00 Tesla

11. A wire carries a current of 280 A in a circular arc with radius 2.48 cm swept through 46 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 2.032E+00 Tesla

B. 2.236E+00 Tesla

C. 2.459E+00 Tesla

D. 2.705E+00 Tesla

E. 2.976E+00 Tesla

12. A wire carries a current of 332 A in a circular arc with radius 2.47 cm swept through 44 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 3.389E+00 Tesla

   B. 3.727E+00 Tesla

   C. 4.100E+00 Tesla

   D. 4.510E+00 Tesla

   E. 4.961E+00 Tesla

13. A wire carries a current of 297 A in a circular arc with radius 2.31 cm swept through 75 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 3.774E+00 Tesla

   B. 4.151E+00 Tesla

   C. 4.566E+00 Tesla

   D. 5.023E+00 Tesla

   E. 5.525E+00 Tesla

14. A wire carries a current of 343 A in a circular arc with radius 2.95 cm swept through 38 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 1.902E+00 Tesla

   B. 2.092E+00 Tesla

   C. 2.301E+00 Tesla

   D. 2.532E+00 Tesla

   E. 2.785E+00 Tesla

15. A wire carries a current of 269 A in a circular arc with radius 2.35 cm swept through 36 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 1.613E+00 Tesla

   B. 1.774E+00 Tesla

   C. 1.951E+00 Tesla

   D. 2.146E+00 Tesla

   E. 2.361E+00 Tesla

16. A wire carries a current of 293 A in a circular arc with radius 1.75 cm swept through 71 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 4.652E+00 Tesla

   B. 5.117E+00 Tesla

   C. 5.629E+00 Tesla

   D. 6.192E+00 Tesla

   E. 6.811E+00 Tesla

17. A wire carries a current of 148 A in a circular arc with radius 1.44 cm swept through 73 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

   A. 4.299E+00 Tesla

   B. 4.729E+00 Tesla

   C. 5.202E+00 Tesla

D. 5.722E+00 Tesla

E. 6.294E+00 Tesla

18. A wire carries a current of 250 A in a circular arc with radius 2.17 cm swept through 53 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 3.498E+00 Tesla

B. 3.848E+00 Tesla

C. 4.233E+00 Tesla

D. 4.656E+00 Tesla

E. 5.122E+00 Tesla

19. A wire carries a current of 338 A in a circular arc with radius 2.62 cm swept through 79 degrees. Assuming that the rest of the current is 100% shielded by mu-metal, what is the magnetic field at the center of the arc?

A. 4.387E+00 Tesla

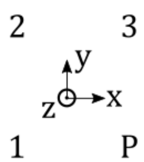
B. 4.826E+00 Tesla

C. 5.309E+00 Tesla

D. 5.839E+00 Tesla

E. 6.423E+00 Tesla

2.2



1. Three wires sit at the corners of a square of length 0.811 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.18 A, 1.44 A, 1.46 A), respectively. What is the x-component of the magnetic field at point P?

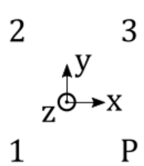
A. B_x= 4.887E-05 T

B. B_x= 5.376E-05 T

C. B_x= 5.914E-05 T

D. B_x= 6.505E-05 T

E. B_x= 7.156E-05 T



2. Three wires sit at the corners of a square of length 0.785 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.23 A, 1.52 A, 1.86 A), respectively. What is the x-component of the magnetic field at point P?

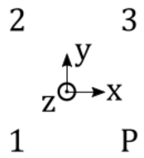
A. B_x= 4.559E-05 T

B. B_x= 5.015E-05 T

C. B_x= 5.517E-05 T

D. B_x= 6.068E-05 T

E. B_x= 6.675E-05 T



3. Three wires sit at the corners of a square of length 0.467 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.29 A, 1.77 A, 1.48 A), respectively. What is the x-component of the magnetic field at point P?

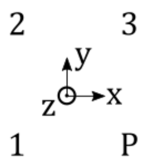
   A. B_x= 8.371E-05 T

   B. B_x= 9.208E-05 T

   C. B_x= 1.013E-04 T

   D. B_x= 1.114E-04 T

   E. B_x= 1.226E-04 T



4. Three wires sit at the corners of a square of length 0.64 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.76 A, 1.02 A, 1.08 A), respectively. What is the x-component of the magnetic field at point P?

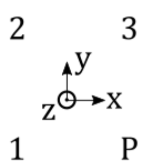
   A. B_x= 3.394E-05 T

   B. B_x= 3.733E-05 T

   C. B_x= 4.106E-05 T

   D. B_x= 4.517E-05 T

   E. B_x= 4.969E-05 T



5. Three wires sit at the corners of a square of length 0.533 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.17 A, 2.25 A, 2.22 A), respectively. What is the x-component of the magnetic field at point P?

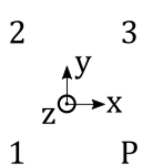
   A. B_x= 1.037E-04 T

   B. B_x= 1.141E-04 T

   C. B_x= 1.255E-04 T

   D. B_x= 1.381E-04 T

   E. B_x= 1.519E-04 T

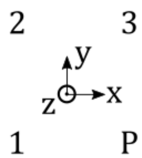


6. Three wires sit at the corners of a square of length 0.51 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.16 A, 2.46 A, 2.15 A), respectively. What is the x-component of the magnetic field at point P?

   A. B_x= 9.053E-05 T

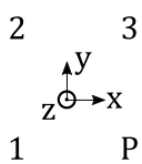
   B. B_x= 9.959E-05 T

C. B_x= 1.095E-04 T
D. B_x= 1.205E-04 T
E. B_x= 1.325E-04 T



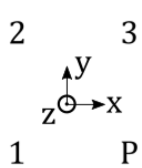
7. Three wires sit at the corners of a square of length 0.78 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.13 A, 1.35 A, 2.02 A), respectively. What is the x-component of the magnetic field at point P?

A. B_x= 6.282E-05 T
B. B_x= 6.910E-05 T
C. B_x= 7.601E-05 T
D. B_x= 8.361E-05 T
E. B_x= 9.198E-05 T



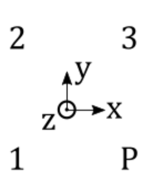
8. Three wires sit at the corners of a square of length 0.796 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.48 A, 1.4 A, 1.47 A), respectively. What is the x-component of the magnetic field at point P?

A. B_x= 4.506E-05 T
B. B_x= 4.957E-05 T
C. B_x= 5.452E-05 T
D. B_x= 5.997E-05 T
E. B_x= 6.597E-05 T



9. Three wires sit at the corners of a square of length 0.75 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.1 A, 1.11 A, 2.26 A), respectively. What is the x-component of the magnetic field at point P?

A. B_x= 7.507E-05 T
B. B_x= 8.257E-05 T
C. B_x= 9.083E-05 T
D. B_x= 9.991E-05 T
E. B_x= 1.099E-04 T



10. Three wires sit at the corners of a square of length 0.705 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.92 A, 1.14 A, 1.11 A), respectively. What is the x-component of the magnetic field at point P?

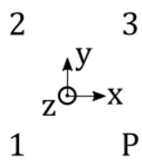
A. B_x= 4.333E-05 T

B. B_x= 4.766E-05 T

C. B_x= 5.243E-05 T

D. B_x= 5.767E-05 T

E. B_x= 6.343E-05 T



11. Three wires sit at the corners of a square of length 0.518 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.31 A, 1.32 A, 1.62 A), respectively. What is the x-component of the magnetic field at point P?

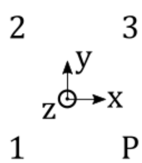
A. B_x= 6.013E-05 T

B. B_x= 6.614E-05 T

C. B_x= 7.275E-05 T

D. B_x= 8.003E-05 T

E. B_x= 8.803E-05 T



12. Three wires sit at the corners of a square of length 0.784 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.19 A, 1.51 A, 2.18 A), respectively. What is the x-component of the magnetic field at point P?

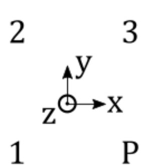
A. B_x= 7.487E-05 T

B. B_x= 8.236E-05 T

C. B_x= 9.060E-05 T

D. B_x= 9.966E-05 T

E. B_x= 1.096E-04 T



13. Three wires sit at the corners of a square of length 0.739 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.93 A, 2.48 A, 1.36 A), respectively. What is the x-component of the magnetic field at point P?

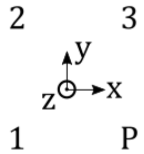
A. B_x= 6.397E-05 T

B. B_x= 7.037E-05 T

C. B_x= 7.740E-05 T

D. B_x= 8.514E-05 T

E. B_x= 9.366E-05 T



14. Three wires sit at the corners of a square of length 0.687 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.38 A, 1.87 A, 2.03 A), respectively. What is the x-component of the magnetic field at point P?

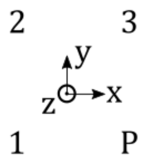
A. B_x= 7.134E-05 T

B. B_x= 7.847E-05 T

C. B_x= 8.632E-05 T

D. B_x= 9.495E-05 T

E. B_x= 1.044E-04 T



15. Three wires sit at the corners of a square of length 0.466 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.4 A, 2.42 A, 1.9 A), respectively. What is the x-component of the magnetic field at point P?

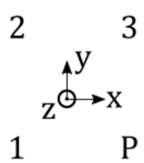
A. B_x= 1.335E-04 T

B. B_x= 1.468E-04 T

C. B_x= 1.615E-04 T

D. B_x= 1.777E-04 T

E. B_x= 1.954E-04 T



16. Three wires sit at the corners of a square of length 0.774 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.57 A, 2.03 A, 2.08 A), respectively. What is the x-component of the magnetic field at point P?

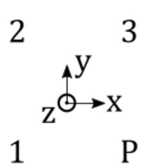
A. B_x= 7.270E-05 T

B. B_x= 7.997E-05 T

C. B_x= 8.797E-05 T

D. B_x= 9.677E-05 T

E. B_x= 1.064E-04 T



17. Three wires sit at the corners of a square of length 0.688 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.73 A, 1.37 A, 1.65 A), respectively. What is the x-component of the magnetic field at point P?

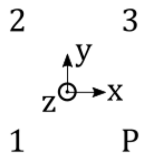
A. B_x= 6.171E-05 T

B. B_x= 6.788E-05 T

C. B_x= 7.467E-05 T

D. B_x= 8.213E-05 T

E. B_x= 9.035E-05 T



18. Three wires sit at the corners of a square of length 0.832 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.03 A, 1.95 A, 2.02 A), respectively. What is the x-component of the magnetic field at point P?

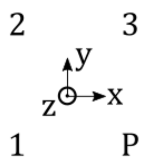
A. B_x= 6.545E-05 T

B. B_x= 7.200E-05 T

C. B_x= 7.919E-05 T

D. B_x= 8.711E-05 T

E. B_x= 9.583E-05 T



19. Three wires sit at the corners of a square of length 0.686 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.28 A, 1.27 A, 1.61 A), respectively. What is the x-component of the magnetic field at point P?

A. B_x= 5.409E-05 T

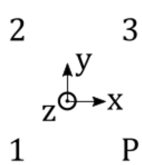
B. B_x= 5.950E-05 T

C. B_x= 6.545E-05 T

D. B_x= 7.200E-05 T

E. B_x= 7.920E-05 T

2.3



1. Three wires sit at the corners of a square of length 0.762 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.69 A, 1.7 A, 1.02 A), respectively. What is the y-component of the magnetic field at point P?

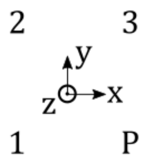
A. B_y= 5.510E-05 T

B. B_y= 6.061E-05 T

C. B_y= 6.667E-05 T

D. B_y= 7.333E-05 T

E. B_y= 8.067E-05 T



2. Three wires sit at the corners of a square of length 0.787 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.68 A, 2.44 A, 2.47 A), respectively. What is the y-component of the magnetic field at point P?

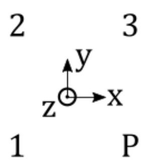
   A. B_y= 6.091E-05 T

   B. B_y= 6.700E-05 T

   C. B_y= 7.370E-05 T

   D. B_y= 8.107E-05 T

   E. B_y= 8.917E-05 T



3. Three wires sit at the corners of a square of length 0.819 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.01 A, 1.09 A, 1.56 A), respectively. What is the y-component of the magnetic field at point P?

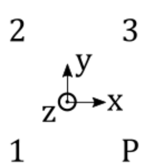
   A. B_y= 4.688E-05 T

   B. B_y= 5.156E-05 T

   C. B_y= 5.672E-05 T

   D. B_y= 6.239E-05 T

   E. B_y= 6.863E-05 T



4. Three wires sit at the corners of a square of length 0.76 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.91 A, 1.34 A, 1.05 A), respectively. What is the y-component of the magnetic field at point P?

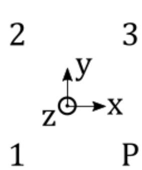
   A. B_y= 5.611E-05 T

   B. B_y= 6.172E-05 T

   C. B_y= 6.789E-05 T

   D. B_y= 7.468E-05 T

   E. B_y= 8.215E-05 T

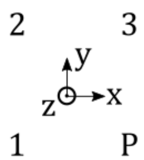


5. Three wires sit at the corners of a square of length 0.859 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.07 A, 1.32 A, 2.03 A), respectively. What is the y-component of the magnetic field at point P?

   A. B_y= 4.028E-05 T

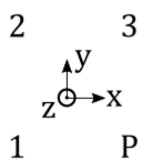
   B. B_y= 4.431E-05 T

C. B_y= 4.874E-05 T
D. B_y= 5.361E-05 T
E. B_y= 5.897E-05 T



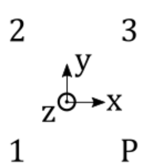
6. Three wires sit at the corners of a square of length 0.547 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.78 A, 1.34 A, 1.64 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 6.118E-05 T
B. B_y= 6.730E-05 T
C. B_y= 7.403E-05 T
D. B_y= 8.144E-05 T
E. B_y= 8.958E-05 T



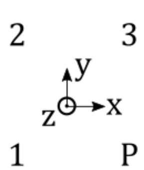
7. Three wires sit at the corners of a square of length 0.793 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.32 A, 1.4 A, 2.27 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 3.480E-05 T
B. B_y= 3.828E-05 T
C. B_y= 4.210E-05 T
D. B_y= 4.631E-05 T
E. B_y= 5.095E-05 T



8. Three wires sit at the corners of a square of length 0.591 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.47 A, 2.1 A, 2.24 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 1.191E-04 T
B. B_y= 1.310E-04 T
C. B_y= 1.441E-04 T
D. B_y= 1.585E-04 T
E. B_y= 1.744E-04 T



9. Three wires sit at the corners of a square of length 0.66 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.18 A, 1.82 A, 1.35 A), respectively. What is the y-component of the magnetic field at point P?

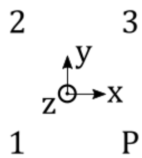
A. B_y= 7.035E-05 T

B. B_y= 7.739E-05 T

C. B_y= 8.512E-05 T

D. B_y= 9.364E-05 T

E. B_y= 1.030E-04 T



10. Three wires sit at the corners of a square of length 0.532 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.11 A, 1.25 A, 2.27 A), respectively. What is the y-component of the magnetic field at point P?

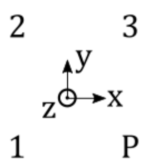
A. B_y= 5.930E-05 T

B. B_y= 6.523E-05 T

C. B_y= 7.175E-05 T

D. B_y= 7.892E-05 T

E. B_y= 8.682E-05 T



11. Three wires sit at the corners of a square of length 0.703 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.49 A, 1.32 A, 1.75 A), respectively. What is the y-component of the magnetic field at point P?

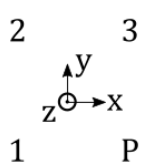
A. B_y= 8.962E-05 T

B. B_y= 9.858E-05 T

C. B_y= 1.084E-04 T

D. B_y= 1.193E-04 T

E. B_y= 1.312E-04 T



12. Three wires sit at the corners of a square of length 0.865 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.62 A, 2.13 A, 2.2 A), respectively. What is the y-component of the magnetic field at point P?

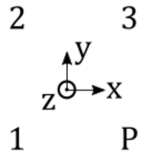
A. B_y= 5.131E-05 T

B. B_y= 5.644E-05 T

C. B_y= 6.208E-05 T

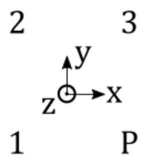
D. B_y= 6.829E-05 T

E. B_y= 7.512E-05 T

13. 

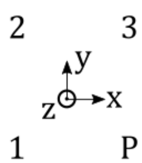
Three wires sit at the corners of a square of length 0.534 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.45 A, 2.44 A, 1.61 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 9.388E-05 T
B. B_y= 1.033E-04 T
C. B_y= 1.136E-04 T
D. B_y= 1.250E-04 T
E. B_y= 1.375E-04 T

14. 

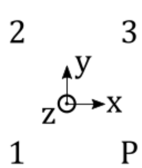
Three wires sit at the corners of a square of length 0.699 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.87 A, 2.18 A, 1.34 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 6.999E-05 T
B. B_y= 7.699E-05 T
C. B_y= 8.469E-05 T
D. B_y= 9.316E-05 T
E. B_y= 1.025E-04 T

15. 

Three wires sit at the corners of a square of length 0.834 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.26 A, 1.75 A, 2.47 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 7.518E-05 T
B. B_y= 8.270E-05 T
C. B_y= 9.097E-05 T
D. B_y= 1.001E-04 T
E. B_y= 1.101E-04 T

16. 

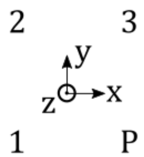
Three wires sit at the corners of a square of length 0.716 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (1.94 A, 2.04 A, 2.41 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 6.833E-05 T
B. B_y= 7.517E-05 T

C. B_y= 8.268E-05 T

D. B_y= 9.095E-05 T

E. B_y= 1.000E-04 T



17. Three wires sit at the corners of a square of length 0.495 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.45 A, 1.66 A, 1.63 A), respectively. What is the y-component of the magnetic field at point P?

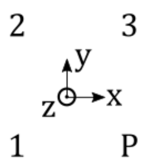
A. B_y= 1.205E-04 T

B. B_y= 1.325E-04 T

C. B_y= 1.458E-04 T

D. B_y= 1.604E-04 T

E. B_y= 1.764E-04 T



18. Three wires sit at the corners of a square of length 0.702 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.24 A, 1.37 A, 2.3 A), respectively. What is the y-component of the magnetic field at point P?

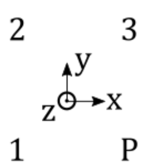
A. B_y= 7.576E-05 T

B. B_y= 8.333E-05 T

C. B_y= 9.167E-05 T

D. B_y= 1.008E-04 T

E. B_y= 1.109E-04 T



19. Three wires sit at the corners of a square of length 0.823 cm. The currents all are in the positive-z direction (i.e. all come out of the paper in the figure shown.) The currents (I_1, I_2, I_2) are (2.41 A, 1.87 A, 2.21 A), respectively. What is the y-component of the magnetic field at point P?

A. B_y= 6.718E-05 T

B. B_y= 7.390E-05 T

C. B_y= 8.129E-05 T

D. B_y= 8.942E-05 T

E. B_y= 9.836E-05 T

2.4

1. Two parallel wires each carry a 5.0 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.48 cm, 0.973 cm), while the other is located at (3.32 cm, 4.79 cm). What is the force per unit length between the wires?

A. 1.139E-10 N/m

B. 1.253E-10 N/m

C. 1.379E-10 N/m

D. 1.517E-10 N/m

E. 1.668E-10 N/m

2. Two parallel wires each carry a 9.68 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.55 cm, 1.79 cm), while the other is located at (3.16 cm, 4.78 cm). What is the force per unit length between the wires?

   A. 3.882E-10 N/m

   B. 4.270E-10 N/m

   C. 4.697E-10 N/m

   D. 5.167E-10 N/m

   E. 5.684E-10 N/m

3. Two parallel wires each carry a 9.08 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.17 cm, 1.32 cm), while the other is located at (5.72 cm, 4.47 cm). What is the force per unit length between the wires?

   A. 3.882E-10 N/m

   B. 4.270E-10 N/m

   C. 4.697E-10 N/m

   D. 5.167E-10 N/m

   E. 5.683E-10 N/m

4. Two parallel wires each carry a 8.75 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.66 cm, 1.4 cm), while the other is located at (5.64 cm, 5.66 cm). What is the force per unit length between the wires?

   A. 2.449E-10 N/m

   B. 2.694E-10 N/m

   C. 2.963E-10 N/m

   D. 3.260E-10 N/m

   E. 3.586E-10 N/m

5. Two parallel wires each carry a 7.75 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.62 cm, 1.31 cm), while the other is located at (4.63 cm, 5.53 cm). What is the force per unit length between the wires?

   A. 2.588E-10 N/m

   B. 2.847E-10 N/m

   C. 3.131E-10 N/m

   D. 3.444E-10 N/m

   E. 3.789E-10 N/m

6. Two parallel wires each carry a 7.48 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.13 cm, 0.955 cm), while the other is located at (5.37 cm, 5.48 cm). What is the force per unit length between the wires?

   A. 2.015E-10 N/m

B. 2.216E-10 N/m

C. 2.438E-10 N/m

D. 2.682E-10 N/m

E. 2.950E-10 N/m

7. Two parallel wires each carry a 2.58 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.79 cm, 1.03 cm), while the other is located at (5.64 cm, 5.12 cm). What is the force per unit length between the wires?

A. 2.634E-11 N/m

B. 2.897E-11 N/m

C. 3.187E-11 N/m

D. 3.506E-11 N/m

E. 3.856E-11 N/m

8. Two parallel wires each carry a 2.83 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.15 cm, 1.13 cm), while the other is located at (5.14 cm, 4.22 cm). What is the force per unit length between the wires?

A. 2.977E-11 N/m

B. 3.274E-11 N/m

C. 3.602E-11 N/m

D. 3.962E-11 N/m

E. 4.358E-11 N/m

9. Two parallel wires each carry a 6.53 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.82 cm, 1.17 cm), while the other is located at (4.07 cm, 5.5 cm). What is the force per unit length between the wires?

A. 1.788E-10 N/m

B. 1.966E-10 N/m

C. 2.163E-10 N/m

D. 2.379E-10 N/m

E. 2.617E-10 N/m

10. Two parallel wires each carry a 3.8 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.74 cm, 1.47 cm), while the other is located at (5.26 cm, 5.87 cm). What is the force per unit length between the wires?

A. 5.926E-11 N/m

B. 6.518E-11 N/m

C. 7.170E-11 N/m

D. 7.887E-11 N/m

E. 8.676E-11 N/m

11. Two parallel wires each carry a 1.65 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.59 cm, 1.81 cm), while the other is located at (5.78 cm, 4.43 cm). What is the force per unit length between the wires?

A. 1.422E-11 N/m

B. 1.564E-11 N/m

C. 1.720E-11 N/m

D. 1.892E-11 N/m

E. 2.081E-11 N/m

12. Two parallel wires each carry a 3.51 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (4.14 cm, 1.43 cm), while the other is located at (4.14 cm, 5.23 cm). What is the force per unit length between the wires?

    A. 6.484E-11 N/m

    B. 7.133E-11 N/m

    C. 7.846E-11 N/m

    D. 8.631E-11 N/m

    E. 9.494E-11 N/m

13. Two parallel wires each carry a 9.59 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.97 cm, 1.4 cm), while the other is located at (4.02 cm, 5.19 cm). What is the force per unit length between the wires?

    A. 4.412E-10 N/m

    B. 4.853E-10 N/m

    C. 5.338E-10 N/m

    D. 5.872E-10 N/m

    E. 6.459E-10 N/m

14. Two parallel wires each carry a 2.12 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.67 cm, 1.25 cm), while the other is located at (4.69 cm, 4.27 cm). What is the force per unit length between the wires?

    A. 2.119E-11 N/m

    B. 2.331E-11 N/m

    C. 2.564E-11 N/m

    D. 2.820E-11 N/m

    E. 3.102E-11 N/m

15. Two parallel wires each carry a 7.59 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.98 cm, 0.969 cm), while the other is located at (5.13 cm, 5.53 cm). What is the force per unit length between the wires?

    A. 1.840E-10 N/m

    B. 2.024E-10 N/m

    C. 2.227E-10 N/m

    D. 2.449E-10 N/m

    E. 2.694E-10 N/m

16. Two parallel wires each carry a 7.68 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.36 cm, 1.58 cm), while the other is located at (5.29 cm, 5.18 cm). What is the force per unit length between the wires?

    A. 1.973E-10 N/m

    B. 2.170E-10 N/m

    C. 2.387E-10 N/m

D. 2.625E-10 N/m

E. 2.888E-10 N/m

17. Two parallel wires each carry a 4.15 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.19 cm, 1.78 cm), while the other is located at (3.73 cm, 4.12 cm). What is the force per unit length between the wires?

A. 1.434E-10 N/m

B. 1.578E-10 N/m

C. 1.736E-10 N/m

D. 1.909E-10 N/m

E. 2.100E-10 N/m

18. Two parallel wires each carry a 6.26 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.4 cm, 1.42 cm), while the other is located at (5.56 cm, 4.99 cm). What is the force per unit length between the wires?

A. 1.283E-10 N/m

B. 1.411E-10 N/m

C. 1.552E-10 N/m

D. 1.708E-10 N/m

E. 1.878E-10 N/m

19. Two parallel wires each carry a 3.38 mA current and are oriented in the z direction. The first wire is located in the x-y plane at (3.46 cm, 1.76 cm), while the other is located at (5.13 cm, 5.5 cm). What is the force per unit length between the wires?

A. 3.810E-11 N/m

B. 4.191E-11 N/m

C. 4.610E-11 N/m

D. 5.071E-11 N/m

E. 5.578E-11 N/m

2.5

1. Two loops of wire carry the same current of 62 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.584 m while the other has a radius of 1.38 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.341 m from the first (smaller) loopif the disance between the loops is 1.21 m?

A. 4.102E-02 T

B. 4.513E-02 T

C. 4.964E-02 T

D. 5.460E-02 T

E. 6.006E-02 T

2. Two loops of wire carry the same current of 18 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.848 m while the other has a radius of 1.42 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.625 m from the first (smaller) loopif the disance between the loops is 1.55 m?

A. 7.952E-03 T

B. 8.747E-03 T

C. 9.622E-03 T

D. 1.058E-02 T

E. 1.164E-02 T

3. Two loops of wire carry the same current of 85 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.854 m while the other has a radius of 1.18 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.5 m from the first (smaller) loopif the disance between the loops is 1.66 m?

A. 4.253E-02 T

B. 4.678E-02 T

C. 5.146E-02 T

D. 5.661E-02 T

E. 6.227E-02 T

4. Two loops of wire carry the same current of 67 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.847 m while the other has a radius of 1.15 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.408 m from the first (smaller) loopif the disance between the loops is 1.15 m?

A. 4.799E-02 T

B. 5.278E-02 T

C. 5.806E-02 T

D. 6.387E-02 T

E. 7.026E-02 T

5. Two loops of wire carry the same current of 12 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.751 m while the other has a radius of 1.42 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.493 m from the first (smaller) loopif the disance between the loops is 1.26 m?

A. 7.836E-03 T

B. 8.620E-03 T

C. 9.482E-03 T

D. 1.043E-02 T

E. 1.147E-02 T

6. Two loops of wire carry the same current of 88 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.655 m while the other has a radius of 1.11 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.531 m from the first (smaller) loopif the disance between the loops is 1.72 m?

A. 4.162E-02 T

B. 4.578E-02 T

C. 5.036E-02 T

D. 5.540E-02 T

E. 6.094E-02 T

7. Two loops of wire carry the same current of 29 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.76 m while the other has a radius of 1.12 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.544 m from the first (smaller) loopif the disance between the loops is 1.56 m?

   A. 1.950E-02 T

   B. 2.145E-02 T

   C. 2.360E-02 T

   D. 2.596E-02 T

   E. 2.855E-02 T

8. Two loops of wire carry the same current of 64 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.838 m while the other has a radius of 1.17 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.528 m from the first (smaller) loopif the disance between the loops is 1.62 m?

   A. 3.863E-02 T

   B. 4.249E-02 T

   C. 4.674E-02 T

   D. 5.141E-02 T

   E. 5.655E-02 T

9. Two loops of wire carry the same current of 24 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.53 m while the other has a radius of 1.38 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.485 m from the first (smaller) loopif the disance between the loops is 1.78 m?

   A. 1.294E-02 T

   B. 1.424E-02 T

   C. 1.566E-02 T

   D. 1.723E-02 T

   E. 1.895E-02 T

10. Two loops of wire carry the same current of 20 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.776 m while the other has a radius of 1.2 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.517 m from the first (smaller) loopif the disance between the loops is 1.37 m?

    A. 1.127E-02 T

    B. 1.240E-02 T

    C. 1.364E-02 T

    D. 1.500E-02 T

    E. 1.650E-02 T

11. Two loops of wire carry the same current of 99 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.798 m while the other has a radius of 1.29 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.394 m from the first (smaller) loopif the disance between the loops is 1.29 m?

    A. 8.291E-02 T

    B. 9.120E-02 T

    C. 1.003E-01 T

D. 1.104E-01 T

E. 1.214E-01 T

12. Two loops of wire carry the same current of 21 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.753 m while the other has a radius of 1.47 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.406 m from the first (smaller) loopif the disance between the loops is 1.38 m?

A. 1.559E-02 T

B. 1.715E-02 T

C. 1.886E-02 T

D. 2.075E-02 T

E. 2.283E-02 T

13. Two loops of wire carry the same current of 97 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.595 m while the other has a radius of 1.1 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.63 m from the first (smaller) loopif the disance between the loops is 1.72 m?

A. 5.302E-02 T

B. 5.832E-02 T

C. 6.415E-02 T

D. 7.056E-02 T

E. 7.762E-02 T

14. Two loops of wire carry the same current of 11 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.424 m while the other has a radius of 1.32 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.52 m from the first (smaller) loopif the disance between the loops is 1.25 m?

A. 7.623E-03 T

B. 8.385E-03 T

C. 9.223E-03 T

D. 1.015E-02 T

E. 1.116E-02 T

15. Two loops of wire carry the same current of 66 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.485 m while the other has a radius of 1.27 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.507 m from the first (smaller) loopif the disance between the loops is 1.76 m?

A. 2.733E-02 T

B. 3.007E-02 T

C. 3.307E-02 T

D. 3.638E-02 T

E. 4.002E-02 T

16. Two loops of wire carry the same current of 44 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.678 m while the other has a radius of 1.14 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.508 m from the first (smaller) loopif the disance between the loops is 1.16 m?

A. 3.342E-02 T

B. 3.676E-02 T

C. 4.044E-02 T

D. 4.448E-02 T

E. 4.893E-02 T

17. Two loops of wire carry the same current of 43 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.516 m while the other has a radius of 1.22 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.565 m from the first (smaller) loopif the disance between the loops is 1.78 m?

A. 1.798E-02 T

B. 1.978E-02 T

C. 2.176E-02 T

D. 2.394E-02 T

E. 2.633E-02 T

18. Two loops of wire carry the same current of 39 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.49 m while the other has a radius of 1.11 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.552 m from the first (smaller) loopif the disance between the loops is 1.62 m?

A. 1.564E-02 T

B. 1.720E-02 T

C. 1.892E-02 T

D. 2.081E-02 T

E. 2.289E-02 T

19. Two loops of wire carry the same current of 14 kA, and flow in the same direction. They share a common axis and orientation. One loop has a radius of 0.835 m while the other has a radius of 1.29 m. What is the magnitude of the magnetic field at a point on the axis of both loops, situated between the loops at a distance 0.607 m from the first (smaller) loopif the disance between the loops is 1.61 m?

A. 6.099E-03 T

B. 6.709E-03 T

C. 7.380E-03 T

D. 8.118E-03 T

E. 8.930E-03 T

2.6

1. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.34 mm from the center of a wire of radius 3 mm if the current is 1A?

A. 2.237E-05 T

B. 2.461E-05 T

C. 2.707E-05 T

D. 2.978E-05 T

E. 3.276E-05 T

2. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.86 mm from the center of a wire of radius 3 mm if the current is 1A?

   A. 3.416E-05 T
   B. 3.758E-05 T
   C. 4.133E-05 T
   D. 4.547E-05 T
   E. 5.001E-05 T

3. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.64 mm from the center of a wire of radius 5 mm if the current is 1A?

   A. 1.920E-05 T
   B. 2.112E-05 T
   C. 2.323E-05 T
   D. 2.556E-05 T
   E. 2.811E-05 T

4. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.66 mm from the center of a wire of radius 4 mm if the current is 1A?

   A. 3.325E-05 T
   B. 3.658E-05 T
   C. 4.023E-05 T
   D. 4.426E-05 T
   E. 4.868E-05 T

5. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.59 mm from the center of a wire of radius 5 mm if the current is 1A?

   A. 2.072E-05 T
   B. 2.279E-05 T
   C. 2.507E-05 T
   D. 2.758E-05 T
   E. 3.034E-05 T

6. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.51 mm from the center of a wire of radius 5 mm if the current is 1A?

   A. 1.208E-05 T
   B. 1.329E-05 T
   C. 1.462E-05 T
   D. 1.608E-05 T
   E. 1.769E-05 T

7. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.03 mm from the center of a wire of radius 3 mm if the current is 1A?

   A. 1.720E-05 T
   B. 1.892E-05 T
   C. 2.081E-05 T

D. 2.289E-05 T

E. 2.518E-05 T

8. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.43 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.944E-05 T

B. 2.138E-05 T

C. 2.352E-05 T

D. 2.587E-05 T

E. 2.846E-05 T

9. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.9 mm from the center of a wire of radius 4 mm if the current is 1A?

A. 1.784E-05 T

B. 1.963E-05 T

C. 2.159E-05 T

D. 2.375E-05 T

E. 2.613E-05 T

10. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 3.33 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 2.202E-05 T

B. 2.422E-05 T

C. 2.664E-05 T

D. 2.930E-05 T

E. 3.223E-05 T

11. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.81 mm from the center of a wire of radius 3 mm if the current is 1A?

A. 3.324E-05 T

B. 3.657E-05 T

C. 4.022E-05 T

D. 4.424E-05 T

E. 4.867E-05 T

12. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 3.07 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.677E-05 T

B. 1.845E-05 T

C. 2.030E-05 T

D. 2.233E-05 T

E. 2.456E-05 T

13. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.04 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.115E-05 T

B. 1.226E-05 T

C. 1.349E-05 T

D. 1.484E-05 T

E. 1.632E-05 T

14. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.86 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.488E-05 T

B. 1.637E-05 T

C. 1.800E-05 T

D. 1.981E-05 T

E. 2.179E-05 T

15. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.26 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.494E-05 T

B. 1.644E-05 T

C. 1.808E-05 T

D. 1.989E-05 T

E. 2.188E-05 T

16. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 2.66 mm from the center of a wire of radius 5 mm if the current is 1A?

A. 1.935E-05 T

B. 2.128E-05 T

C. 2.341E-05 T

D. 2.575E-05 T

E. 2.832E-05 T

17. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.14 mm from the center of a wire of radius 3 mm if the current is 1A?

A. 2.533E-05 T

B. 2.787E-05 T

C. 3.065E-05 T

D. 3.372E-05 T

E. 3.709E-05 T

18. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.18 mm from the center of a wire of radius 3 mm if the current is 1A?

A. 1.791E-05 T

B. 1.970E-05 T

C. 2.167E-05 T

D. 2.384E-05 T

E. 2.622E-05 T

19. Under most conditions the current is distributed uniformly over the cross section of the wire. What is the magnetic field 1.51 mm from the center of a wire of radius 5 mm if the current is 1A?

   A. 1.098E-05 T
   B. 1.208E-05 T
   C. 1.329E-05 T
   D. 1.462E-05 T
   E. 1.608E-05 T

2.7

1. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.703$ m and $B_{max} =$ 0.521 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.165$ m that is centered on the axis with its plane perpendicular to the axis?

   A. 1.338E+05 A
   B. 1.472E+05 A
   C. 1.619E+05 A
   D. 1.781E+05 A
   E. 1.959E+05 A

2. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.259$ m and $B_{max} =$ 0.575 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.191$ m that is centered on the axis with its plane perpendicular to the axis?

   A. 3.492E+05 A
   B. 3.841E+05 A
   C. 4.225E+05 A
   D. 4.648E+05 A
   E. 5.113E+05 A

3. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.353$ m and $B_{max} =$ 0.697 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.196$ m that is centered on the axis with its plane perpendicular to the axis?

   A. 5.479E+05 A
   B. 6.027E+05 A
   C. 6.630E+05 A
   D. 7.293E+05 A
   E. 8.022E+05 A

4. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.52$ m and $B_{max} =$ 0.657 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.295$ m that is centered on the axis with its plane perpendicular to the axis?

A. 7.876E+05 A

B. 8.664E+05 A

C. 9.530E+05 A

D. 1.048E+06 A

E. 1.153E+06 A

5. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.248$ m and $B_{max} = 0.459$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.152$ m that is centered on the axis with its plane perpendicular to the axis?

A. 2.228E+05 A

B. 2.451E+05 A

C. 2.696E+05 A

D. 2.966E+05 A

E. 3.262E+05 A

6. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.51$ m and $B_{max} = 0.649$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.376$ m that is centered on the axis with its plane perpendicular to the axis?

A. 9.388E+05 A

B. 1.033E+06 A

C. 1.136E+06 A

D. 1.249E+06 A

E. 1.374E+06 A

7. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.549$ m and $B_{max} = 0.599$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.29$ m that is centered on the axis with its plane perpendicular to the axis?

A. 5.581E+05 A

B. 6.139E+05 A

C. 6.752E+05 A

D. 7.428E+05 A

E. 8.170E+05 A

8. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.37$ m and $B_{max} = 0.556$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.14$ m that is centered on the axis with its plane perpendicular to the axis?

A. 2.171E+05 A

B. 2.388E+05 A

C. 2.627E+05 A

D. 2.890E+05 A

E. 3.179E+05 A

9. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.547$ m and $B_{max} =$ 0.597 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.158$ m that is centered on the axis with its plane perpendicular to the axis?

A. 1.751E+05 A

B. 1.927E+05 A

C. 2.119E+05 A

D. 2.331E+05 A

E. 2.564E+05 A

10. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.568$ m and $B_{max} =$ 0.214 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.387$ m that is centered on the axis with its plane perpendicular to the axis?

A. 3.382E+05 A

B. 3.720E+05 A

C. 4.092E+05 A

D. 4.502E+05 A

E. 4.952E+05 A

11. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.619$ m and $B_{max} =$ 0.215 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.351$ m that is centered on the axis with its plane perpendicular to the axis?

A. 2.534E+05 A

B. 2.787E+05 A

C. 3.066E+05 A

D. 3.373E+05 A

E. 3.710E+05 A

12. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.736$ m and $B_{max} =$ 0.204 T, then how much current (in the z-direction) flows through a circle of radius $r = 0.532$ m that is centered on the axis with its plane perpendicular to the axis?

A. 3.764E+05 A

B. 4.140E+05 A

C. 4.554E+05 A

D. 5.010E+05 A

E. 5.510E+05 A

13. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.253$ m and $B_{max} = 0.489$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.112$ m that is centered on the axis with its plane perpendicular to the axis?

A. 1.289E+05 A

B. 1.418E+05 A

C. 1.560E+05 A

D. 1.716E+05 A

E. 1.888E+05 A

14. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.852$ m and $B_{max} = 0.476$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.212$ m that is centered on the axis with its plane perpendicular to the axis?

A. 1.502E+05 A

B. 1.652E+05 A

C. 1.817E+05 A

D. 1.999E+05 A

E. 2.199E+05 A

15. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.571$ m and $B_{max} = 0.331$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.321$ m that is centered on the axis with its plane perpendicular to the axis?

A. 3.226E+05 A

B. 3.549E+05 A

C. 3.904E+05 A

D. 4.294E+05 A

E. 4.724E+05 A

16. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.645$ m and $B_{max} = 0.469$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.26$ m that is centered on the axis with its plane perpendicular to the axis?

A. 2.949E+05 A

B. 3.244E+05 A

C. 3.568E+05 A

D. 3.925E+05 A

E. 4.317E+05 A

17. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.871$ m and $B_{max} = 0.427$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.688$ m that is centered on the axis with its plane perpendicular to the axis?

A. 1.404E+06 A

B. 1.544E+06 A

C. 1.699E+06 A

D. 1.869E+06 A

E. 2.056E+06 A

18. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.432$ m and $B_{max} = 0.402$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.275$ m that is centered on the axis with its plane perpendicular to the axis?

A. 3.277E+05 A

B. 3.604E+05 A

C. 3.965E+05 A

D. 4.361E+05 A

E. 4.797E+05 A

19. The Z-pinch is an (often unstable) cylindrical plasma in which a aximuthal magnetic field is produced by a current in the z direction. A simple model for the magnetic field, valid for $r < a$ is, $B_\theta(r) = \left(\frac{2r}{a} - \frac{r^2}{a^2}\right) B_{max}$, where B_{max} is the maximum magnetic field (at $r = a$). If $a = 0.407$ m and $B_{max} = 0.605$ T, then how much current (in the z-direction) flows through a circle of radius $r = 0.196$ m that is centered on the axis with its plane perpendicular to the axis?

A. 3.583E+05 A

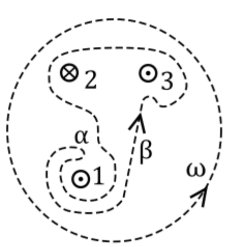
B. 3.941E+05 A

C. 4.335E+05 A

D. 4.769E+05 A

E. 5.246E+05 A

2.8



1. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.39 kA, I_2=2.19 kA, and I_3=3.68 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

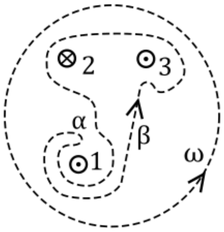
A. 1.547E-03 T-m

B. 1.702E-03 T-m

C. 1.872E-03 T-m

D. 2.060E-03 T-m

E. 2.266E-03 T-m

2. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.32 kA, I_2=2.0 kA, and I_3=3.66 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

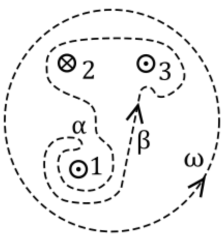
A. 1.724E-03 T-m

B. 1.896E-03 T-m

C. 2.086E-03 T-m

D. 2.295E-03 T-m

E. 2.524E-03 T-m

3. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.55 kA, I_2=1.02 kA, and I_3=1.81 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

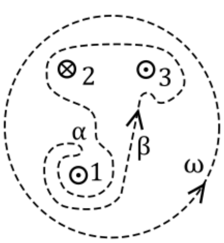
A. 8.204E-04 T-m

B. 9.025E-04 T-m

C. 9.927E-04 T-m

D. 1.092E-03 T-m

E. 1.201E-03 T-m

4. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.44 kA, I_2=1.1 kA, and I_3=1.99 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

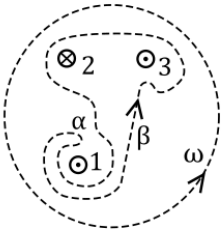
A. 1.017E-03 T-m

B. 1.118E-03 T-m

C. 1.230E-03 T-m

D. 1.353E-03 T-m

E. 1.489E-03 T-m



5. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.82 kA, I_2=0.964 kA, and I_3=2.21 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

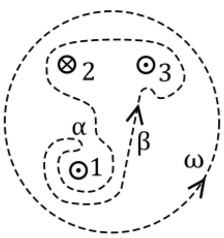
A. 1.069E-03 T-m

B. 1.176E-03 T-m

C. 1.294E-03 T-m

D. 1.423E-03 T-m

E. 1.566E-03 T-m



6. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.4 kA, I_2=2.64 kA, and I_3=3.96 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

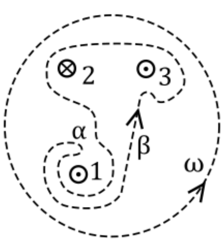
A. 1.133E-03 T-m

B. 1.246E-03 T-m

C. 1.371E-03 T-m

D. 1.508E-03 T-m

E. 1.659E-03 T-m



7. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.51 kA, I_2=1.32 kA, and I_3=2.73 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

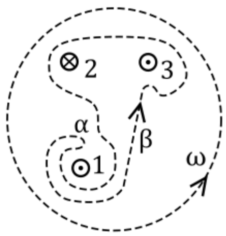
A. 1.331E-03 T-m

B. 1.464E-03 T-m

C. 1.611E-03 T-m

D. 1.772E-03 T-m

E. 1.949E-03 T-m

8. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.49 kA, I_2=0.996 kA, and I_3=2.61 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

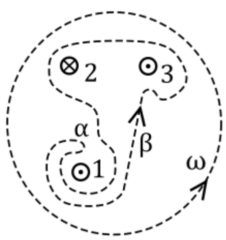
A. 1.385E-03 T-m

B. 1.524E-03 T-m

C. 1.676E-03 T-m

D. 1.844E-03 T-m

E. 2.028E-03 T-m

9. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.5 kA, I_2=1.53 kA, and I_3=2.34 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

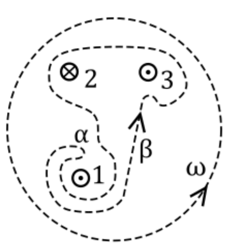
A. 1.018E-03 T-m

B. 1.120E-03 T-m

C. 1.232E-03 T-m

D. 1.355E-03 T-m

E. 1.490E-03 T-m

10. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.66 kA, I_2=1.25 kA, and I_3=2.74 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

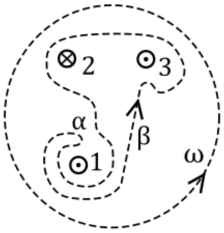
A. 1.547E-03 T-m

B. 1.702E-03 T-m

C. 1.872E-03 T-m

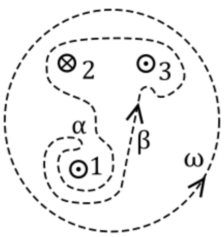
D. 2.060E-03 T-m

E. 2.266E-03 T-m

11. 

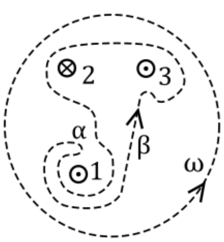
The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.61 kA, I_2=2.2 kA, and I_3=5.1 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

A. 3.644E-03 T-m
B. 4.009E-03 T-m
C. 4.410E-03 T-m
D. 4.850E-03 T-m
E. 5.336E-03 T-m

12. 

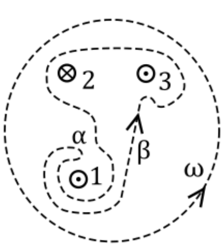
The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.48 kA, I_2=1.47 kA, and I_3=2.6 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

A. 1.420E-03 T-m
B. 1.562E-03 T-m
C. 1.718E-03 T-m
D. 1.890E-03 T-m
E. 2.079E-03 T-m

13. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.51 kA, I_2=2.33 kA, and I_3=5.35 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

A. 3.795E-03 T-m
B. 4.175E-03 T-m
C. 4.592E-03 T-m
D. 5.051E-03 T-m
E. 5.556E-03 T-m

14. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.85 kA, I_2=1.8 kA, and I_3=4.89 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

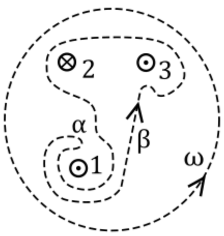
A. 3.530E-03 T-m

B. 3.883E-03 T-m

C. 4.271E-03 T-m

D. 4.698E-03 T-m

E. 5.168E-03 T-m



15. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.31 kA, I_2=1.08 kA, and I_3=1.77 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

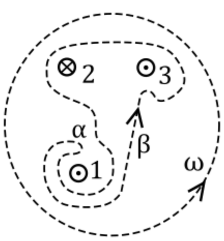
A. 7.166E-04 T-m

B. 7.883E-04 T-m

C. 8.671E-04 T-m

D. 9.538E-04 T-m

E. 1.049E-03 T-m



16. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.43 kA, I_2=1.64 kA, and I_3=4.81 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

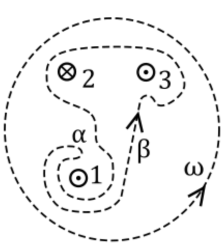
A. 2.721E-03 T-m

B. 2.993E-03 T-m

C. 3.292E-03 T-m

D. 3.621E-03 T-m

E. 3.984E-03 T-m



17. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.45 kA, I_2=2.68 kA, and I_3=5.5 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

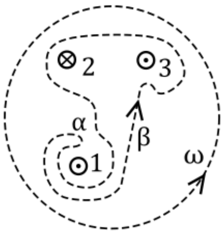
A. 3.544E-03 T-m

B. 3.898E-03 T-m

C. 4.288E-03 T-m

D. 4.717E-03 T-m

E. 5.188E-03 T-m



18. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.43 kA, I_2=1.81 kA, and I_3=3.23 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

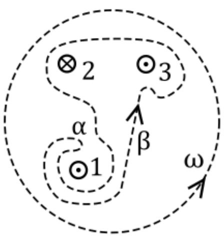
A. 1.622E-03 T-m

B. 1.784E-03 T-m

C. 1.963E-03 T-m

D. 2.159E-03 T-m

E. 2.375E-03 T-m



19. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.84 kA, I_2=0.476 kA, and I_3=1.57 kA, take the β path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

A. 1.250E-03 T-m

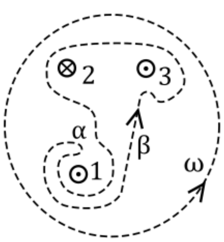
B. 1.375E-03 T-m

C. 1.512E-03 T-m

D. 1.663E-03 T-m

E. 1.830E-03 T-m

2.9



1. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.37 kA, I_2=1.05 kA, and I_3=2.99 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

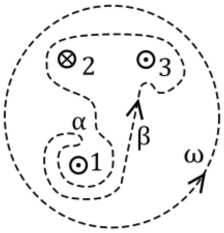
A. 4.069E-03 T-m

B. 4.476E-03 T-m

C. 4.924E-03 T-m

D. 5.416E-03 T-m

E. 5.958E-03 T-m



2. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.39 kA, I_2=0.414 kA, and I_3=1.3 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

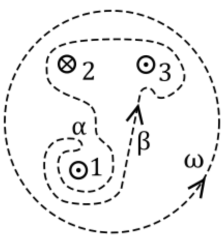
A. 2.812E-03 T-m

B. 3.093E-03 T-m

C. 3.402E-03 T-m

D. 3.742E-03 T-m

E. 4.117E-03 T-m



3. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.84 kA, I_2=3.3 kA, and I_3=5.85 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

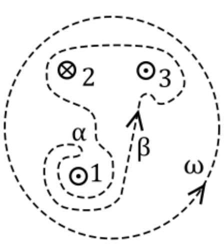
A. 5.598E-03 T-m

B. 6.158E-03 T-m

C. 6.773E-03 T-m

D. 7.451E-03 T-m

E. 8.196E-03 T-m



4. The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.38 kA, I_2=0.839 kA, and I_3=2.27 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

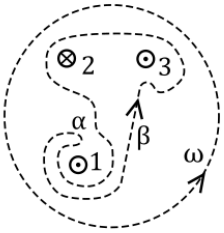
A. 4.354E-03 T-m

B. 4.789E-03 T-m

C. 5.268E-03 T-m

D. 5.795E-03 T-m

E. 6.374E-03 T-m

5. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.81 kA, I_2=1.2 kA, and I_3=1.84 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

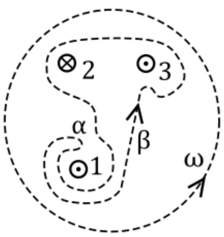
A. 3.583E-03 T-m

B. 3.941E-03 T-m

C. 4.335E-03 T-m

D. 4.769E-03 T-m

E. 5.246E-03 T-m

6. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.35 kA, I_2=0.809 kA, and I_3=2.34 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

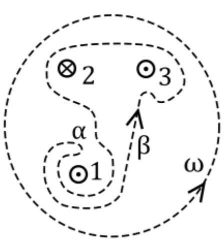
A. 4.031E-03 T-m

B. 4.434E-03 T-m

C. 4.877E-03 T-m

D. 5.365E-03 T-m

E. 5.901E-03 T-m

7. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.58 kA, I_2=1.27 kA, and I_3=1.99 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

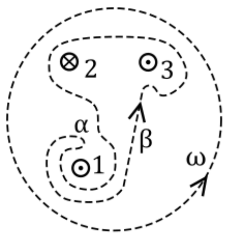
A. 3.770E-03 T-m

B. 4.147E-03 T-m

C. 4.562E-03 T-m

D. 5.018E-03 T-m

E. 5.520E-03 T-m

8. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.89 kA, I_2=1.19 kA, and I_3=3.5 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

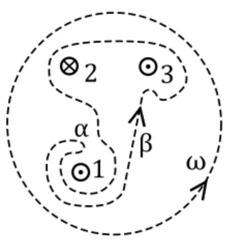
A. 6.535E-03 T-m

B. 7.188E-03 T-m

C. 7.907E-03 T-m

D. 8.697E-03 T-m

E. 9.567E-03 T-m

9. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.46 kA, I_2=2.14 kA, and I_3=4.44 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

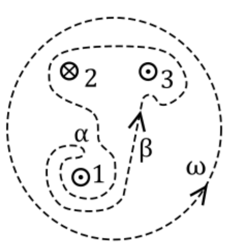
A. 4.943E-03 T-m

B. 5.438E-03 T-m

C. 5.982E-03 T-m

D. 6.580E-03 T-m

E. 7.238E-03 T-m

10. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.33 kA, I_2=0.741 kA, and I_3=2.21 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

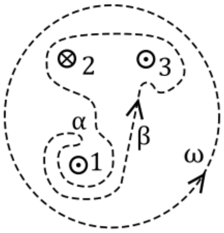
A. 3.261E-03 T-m

B. 3.587E-03 T-m

C. 3.945E-03 T-m

D. 4.340E-03 T-m

E. 4.774E-03 T-m

11. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.58 kA, I_2=1.11 kA, and I_3=2.47 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

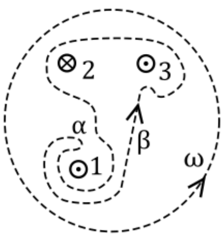
A. 4.092E-03 T-m

B. 4.501E-03 T-m

C. 4.951E-03 T-m

D. 5.446E-03 T-m

E. 5.991E-03 T-m

12. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.42 kA, I_2=0.904 kA, and I_3=1.34 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

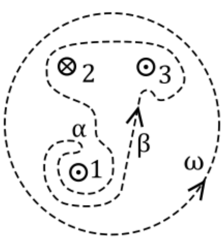
A. 2.696E-03 T-m

B. 2.966E-03 T-m

C. 3.263E-03 T-m

D. 3.589E-03 T-m

E. 3.948E-03 T-m

13. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.84 kA, I_2=2.02 kA, and I_3=4.24 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

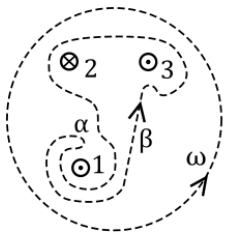
A. 5.255E-03 T-m

B. 5.781E-03 T-m

C. 6.359E-03 T-m

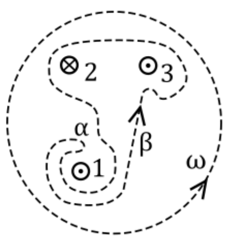
D. 6.994E-03 T-m

E. 7.694E-03 T-m

14. 

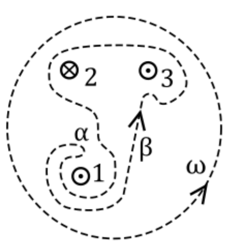
The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.38 kA, I_2=1.58 kA, and I_3=4.31 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

- A. 4.386E-03 T-m
- B. 4.825E-03 T-m
- C. 5.307E-03 T-m
- D. 5.838E-03 T-m
- **E. 6.421E-03 T-m**

15. 

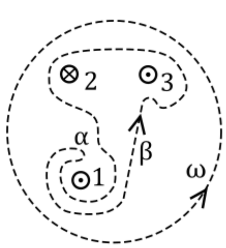
The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.5 kA, I_2=1.28 kA, and I_3=3.4 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

- A. 4.362E-03 T-m
- B. 4.798E-03 T-m
- C. 5.278E-03 T-m
- **D. 5.806E-03 T-m**
- E. 6.386E-03 T-m

16. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.78 kA, I_2=2.61 kA, and I_3=3.76 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

- **A. 4.939E-03 T-m**
- B. 5.432E-03 T-m
- C. 5.976E-03 T-m
- D. 6.573E-03 T-m
- E. 7.231E-03 T-m

17. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.72 kA, I_2=2.17 kA, and I_3=3.21 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

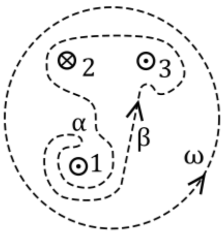
A. 3.905E-03 T-m

B. 4.295E-03 T-m

C. 4.725E-03 T-m

D. 5.197E-03 T-m

E. 5.717E-03 T-m

18. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.57 kA, I_2=0.708 kA, and I_3=1.48 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

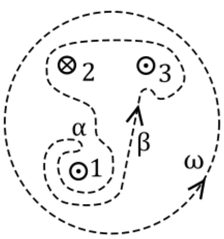
A. 4.200E-03 T-m

B. 4.620E-03 T-m

C. 5.082E-03 T-m

D. 5.590E-03 T-m

E. 6.149E-03 T-m

19. 

The numbers (1,2,3) in the figure shown represent three currents flowing in or out of the page: I_1 and I_3 flow out of the page, and I_2 flows into the page, as shown. Two closed paths are shown, labeled β and ω. If I_1=2.31 kA, I_2=1.16 kA, and I_3=2.13 kA, take the ω path and evalulate the line integral, $\oint \vec{B} \cdot d\vec{\ell}$:

A. 2.815E-03 T-m

B. 3.097E-03 T-m

C. 3.406E-03 T-m

D. 3.747E-03 T-m

E. 4.122E-03 T-m

2.10

1. A solenoid has 8.230E+04 turns wound around a cylinder of diameter 1.5 cm and length 18 m. The current through the coils is 0.633 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-3.74 cm to z=+3.23 cm

A. 1.731E-04 T-m

B. 1.905E-04 T-m

C. 2.095E-04 T-m

D. 2.305E-04 T-m

E. 2.535E-04 T-m

2. A solenoid has 9.350E+04 turns wound around a cylinder of diameter 1.85 cm and length 18 m. The current through the coils is 0.872 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.55 cm to z=+1.58 cm

   A. 2.383E-04 T-m

   B. 2.621E-04 T-m

   C. 2.884E-04 T-m

   D. 3.172E-04 T-m

   E. 3.489E-04 T-m

3. A solenoid has 7.690E+04 turns wound around a cylinder of diameter 1.63 cm and length 11 m. The current through the coils is 0.728 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2.76 cm to z=+1.99 cm

   A. 2.762E-04 T-m

   B. 3.038E-04 T-m

   C. 3.342E-04 T-m

   D. 3.676E-04 T-m

   E. 4.043E-04 T-m

4. A solenoid has 7.920E+04 turns wound around a cylinder of diameter 1.45 cm and length 11 m. The current through the coils is 0.702 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.27 cm to z=+1.36 cm

   A. 2.687E-04 T-m

   B. 2.955E-04 T-m

   C. 3.251E-04 T-m

   D. 3.576E-04 T-m

   E. 3.934E-04 T-m

5. A solenoid has 4.900E+04 turns wound around a cylinder of diameter 1.74 cm and length 19 m. The current through the coils is 0.432 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.18 cm to z=+1.77 cm

   A. 6.884E-05 T-m

   B. 7.573E-05 T-m

   C. 8.330E-05 T-m

   D. 9.163E-05 T-m

   E. 1.008E-04 T-m

6. A solenoid has 9.160E+04 turns wound around a cylinder of diameter 1.64 cm and length 16 m. The current through the coils is 0.873 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-1.74 cm to z=+4.75 cm

   A. 3.369E-04 T-m

   B. 3.706E-04 T-m

   C. 4.076E-04 T-m

   D. 4.484E-04 T-m

   E. 4.932E-04 T-m

7. A solenoid has 9.560E+04 turns wound around a cylinder of diameter 1.18 cm and length 12 m. The current through the coils is 0.664 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.49 cm to z=+3.61 cm

   A. 4.895E-04 T-m

   B. 5.384E-04 T-m

   C. 5.923E-04 T-m

   D. 6.515E-04 T-m

   E. 7.167E-04 T-m

8. A solenoid has 7.540E+04 turns wound around a cylinder of diameter 1.36 cm and length 14 m. The current through the coils is 0.807 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2.75 cm to z=+3.28 cm

   A. 2.722E-04 T-m

   B. 2.994E-04 T-m

   C. 3.293E-04 T-m

   D. 3.623E-04 T-m

   E. 3.985E-04 T-m

9. A solenoid has 5.640E+04 turns wound around a cylinder of diameter 1.35 cm and length 16 m. The current through the coils is 0.912 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-1.11 cm to z=+2.76 cm

   A. 1.068E-04 T-m

   B. 1.175E-04 T-m

   C. 1.292E-04 T-m

   D. 1.421E-04 T-m

   E. 1.563E-04 T-m

10. A solenoid has 4.380E+04 turns wound around a cylinder of diameter 1.77 cm and length 16 m. The current through the coils is 0.916 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.39 cm to z=+4.26 cm

    A. 2.478E-04 T-m

    B. 2.726E-04 T-m

    C. 2.998E-04 T-m

    D. 3.298E-04 T-m

    E. 3.628E-04 T-m

11. A solenoid has 7.170E+04 turns wound around a cylinder of diameter 1.56 cm and length 9 m. The current through the coils is 0.391 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2.73 cm to z=+2.56 cm

    A. 1.414E-04 T-m

    B. 1.556E-04 T-m

    C. 1.711E-04 T-m

    D. 1.882E-04 T-m

    E. 2.071E-04 T-m

12. A solenoid has 5.500E+04 turns wound around a cylinder of diameter 1.45 cm and length 15 m. The current through the coils is 0.395 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-4.19 cm to z=+2.16 cm

   A. 7.894E-05 T-m

   B. 8.683E-05 T-m

   C. 9.551E-05 T-m

   D. 1.051E-04 T-m

   E. 1.156E-04 T-m

13. A solenoid has 8.890E+04 turns wound around a cylinder of diameter 1.32 cm and length 15 m. The current through the coils is 0.297 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-1.41 cm to z=+2.56 cm

   A. 7.257E-05 T-m

   B. 7.983E-05 T-m

   C. 8.781E-05 T-m

   D. 9.660E-05 T-m

   E. 1.063E-04 T-m

14. A solenoid has 9.880E+04 turns wound around a cylinder of diameter 1.5 cm and length 15 m. The current through the coils is 0.981 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-1.56 cm to z=+3.22 cm

   A. 2.916E-04 T-m

   B. 3.208E-04 T-m

   C. 3.528E-04 T-m

   D. 3.881E-04 T-m

   E. 4.269E-04 T-m

15. A solenoid has 3.950E+04 turns wound around a cylinder of diameter 1.64 cm and length 16 m. The current through the coils is 0.441 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2.05 cm to z=+3.97 cm

   A. 6.807E-05 T-m

   B. 7.487E-05 T-m

   C. 8.236E-05 T-m

   D. 9.060E-05 T-m

   E. 9.966E-05 T-m

16. A solenoid has 5.160E+04 turns wound around a cylinder of diameter 1.55 cm and length 18 m. The current through the coils is 0.57 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-2.88 cm to z=+1.52 cm

   A. 6.788E-05 T-m

   B. 7.467E-05 T-m

   C. 8.213E-05 T-m

   D. 9.035E-05 T-m

   E. 9.938E-05 T-m

17. A solenoid has 5.980E+04 turns wound around a cylinder of diameter 1.8 cm and length 17 m. The current through the coils is 0.933 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-3.68 cm to z=+1.29 cm

   A. 1.863E-04 T-m

   B. 2.050E-04 T-m

   C. 2.255E-04 T-m

   D. 2.480E-04 T-m

   E. 2.728E-04 T-m

18. A solenoid has 7.610E+04 turns wound around a cylinder of diameter 1.21 cm and length 9 m. The current through the coils is 0.696 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-1.52 cm to z=+2.04 cm

   A. 2.176E-04 T-m

   B. 2.393E-04 T-m

   C. 2.633E-04 T-m

   D. 2.896E-04 T-m

   E. 3.186E-04 T-m

19. A solenoid has 4.730E+04 turns wound around a cylinder of diameter 1.46 cm and length 15 m. The current through the coils is 0.754 A. Define the origin to be the center of the solenoid and neglect end effects as you calculate the line integral $\int \vec{B} \cdot \vec{\ell}$ alongthe axis from z=-3.4 cm to z=+1.14 cm

   A. 1.121E-04 T-m

   B. 1.233E-04 T-m

   C. 1.356E-04 T-m

   D. 1.492E-04 T-m

   E. 1.641E-04 T-m

2.11

1. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 20 turns per centimeter and the current applied to the solenoid is 598 mA, the net magnetic field is measured to be 1.38 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 8.338E+02

   B. χ (chi) = 9.172E+02

   C. χ (chi) = 1.009E+03

   D. χ (chi) = 1.110E+03

   E. χ (chi) = 1.221E+03

2. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 20 turns per centimeter and the current applied to the solenoid is 344 mA, the net magnetic field is measured to be 1.24 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 1.185E+03

   B. χ (chi) = 1.303E+03

   C. χ (chi) = 1.433E+03

   D. χ (chi) = 1.577E+03

   E. χ (chi) = 1.734E+03

3. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 18 turns per centimeter and the current applied to the solenoid is 582 mA, the net magnetic field is measured to be 1.15 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 7.211E+02
   B. χ (chi) = 7.932E+02
   C. χ (chi) = 8.726E+02
   D. χ (chi) = 9.598E+02
   E. χ (chi) = 1.056E+03

4. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 22 turns per centimeter and the current applied to the solenoid is 568 mA, the net magnetic field is measured to be 1.29 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 8.205E+02
   B. χ (chi) = 9.026E+02
   C. χ (chi) = 9.928E+02
   D. χ (chi) = 1.092E+03
   E. χ (chi) = 1.201E+03

5. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 20 turns per centimeter and the current applied to the solenoid is 525 mA, the net magnetic field is measured to be 1.45 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 8.249E+02
   B. χ (chi) = 9.074E+02
   C. χ (chi) = 9.981E+02
   D. χ (chi) = 1.098E+03
   E. χ (chi) = 1.208E+03

6. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 22 turns per centimeter and the current applied to the solenoid is 265 mA, the net magnetic field is measured to be 1.11 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 1.376E+03
   B. χ (chi) = 1.514E+03
   C. χ (chi) = 1.666E+03
   D. χ (chi) = 1.832E+03
   E. χ (chi) = 2.015E+03

7. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 27 turns per centimeter and the current applied to the solenoid is 344 mA, the net magnetic field is measured to be 1.12 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 7.922E+02
   B. χ (chi) = 8.714E+02
   C. χ (chi) = 9.586E+02
   D. χ (chi) = 1.054E+03
   E. χ (chi) = 1.160E+03

8. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 19 turns per centimeter and the current applied to the solenoid is 421 mA, the net magnetic field is measured to be 1.31 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 1.302E+03

   B. χ (chi) = 1.432E+03

   C. χ (chi) = 1.576E+03

   D. χ (chi) = 1.733E+03

   E. χ (chi) = 1.907E+03

9. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 24 turns per centimeter and the current applied to the solenoid is 595 mA, the net magnetic field is measured to be 1.46 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 6.716E+02

   B. χ (chi) = 7.387E+02

   C. χ (chi) = 8.126E+02

   D. χ (chi) = 8.939E+02

   E. χ (chi) = 9.833E+02

10. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 23 turns per centimeter and the current applied to the solenoid is 534 mA, the net magnetic field is measured to be 1.48 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 7.917E+02

   B. χ (chi) = 8.708E+02

   C. χ (chi) = 9.579E+02

   D. χ (chi) = 1.054E+03

   E. χ (chi) = 1.159E+03

11. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 24 turns per centimeter and the current applied to the solenoid is 242 mA, the net magnetic field is measured to be 1.38 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 1.718E+03

   B. χ (chi) = 1.890E+03

   C. χ (chi) = 2.079E+03

   D. χ (chi) = 2.287E+03

   E. χ (chi) = 2.515E+03

12. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 17 turns per centimeter and the current applied to the solenoid is 455 mA, the net magnetic field is measured to be 1.14 T. What is the magnetic susceptibility for this case?

   A. χ (chi) = 8.804E+02

   B. χ (chi) = 9.685E+02

   C. χ (chi) = 1.065E+03

   D. χ (chi) = 1.172E+03

   E. χ (chi) = 1.289E+03

13. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 16 turns per centimeter and the current applied to the solenoid is 536 mA, the net magnetic field is measured to be 1.47 T. What is the magnetic susceptibility for this case?

    A. χ (chi) = 9.310E+02
    B. χ (chi) = 1.024E+03
    C. χ (chi) = 1.126E+03
    D. χ (chi) = 1.239E+03
    E. χ (chi) = 1.363E+03

14. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 17 turns per centimeter and the current applied to the solenoid is 331 mA, the net magnetic field is measured to be 1.24 T. What is the magnetic susceptibility for this case?

    A. χ (chi) = 1.593E+03
    B. χ (chi) = 1.753E+03
    C. χ (chi) = 1.928E+03
    D. χ (chi) = 2.121E+03
    E. χ (chi) = 2.333E+03

15. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 27 turns per centimeter and the current applied to the solenoid is 280 mA, the net magnetic field is measured to be 1.13 T. What is the magnetic susceptibility for this case?

    A. χ (chi) = 1.188E+03
    B. χ (chi) = 1.307E+03
    C. χ (chi) = 1.438E+03
    D. χ (chi) = 1.582E+03
    E. χ (chi) = 1.740E+03

16. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 27 turns per centimeter and the current applied to the solenoid is 525 mA, the net magnetic field is measured to be 1.44 T. What is the magnetic susceptibility for this case?

    A. χ (chi) = 5.515E+02
    B. χ (chi) = 6.066E+02
    C. χ (chi) = 6.673E+02
    D. χ (chi) = 7.340E+02
    E. χ (chi) = 8.074E+02

17. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 16 turns per centimeter and the current applied to the solenoid is 424 mA, the net magnetic field is measured to be 1.24 T. What is the magnetic susceptibility for this case?

    A. χ (chi) = 1.092E+03
    B. χ (chi) = 1.201E+03
    C. χ (chi) = 1.321E+03
    D. χ (chi) = 1.454E+03
    E. χ (chi) = 1.599E+03

18. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 26 turns per centimeter and the current applied to the solenoid is 533 mA, the net magnetic field is measured to be 1.31 T. What is the magnetic susceptibility for this case?

   A. χ **(chi) = 7.512E+02**

   B. χ (chi) = 8.264E+02

   C. χ (chi) = 9.090E+02

   D. χ (chi) = 9.999E+02

   E. χ (chi) = 1.100E+03

19. A long coil is tightly wound around a (hypothetical) ferromagnetic cylinder. If n= 26 turns per centimeter and the current applied to the solenoid is 359 mA, the net magnetic field is measured to be 1.32 T. What is the magnetic susceptibility for this case?

   A. χ **(chi) = 1.124E+03**

   B. χ (chi) = 1.237E+03

   C. χ (chi) = 1.360E+03

   D. χ (chi) = 1.497E+03

   E. χ (chi) = 1.646E+03

3 Attribution

Notes

[1]Example 12.s from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:dh0GjBEd@2/121-The-Biot-Savart-Law_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[2]Example 12.3 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:ltGE2kXG@3/122-Magnetic-Field-Due-to-a-Th_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[3]Example 12.3 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:ltGE2kXG@3/122-Magnetic-Field-Due-to-a-Th_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[4]Example 12.4 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:VY8a9ouJ@2/123-Magnetic-Force-between-Two_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[5]Example 12.5 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:A6AqGAGN@2/124-Magnetic-Field-of-a-Curren_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[6]Example 12.7 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:zDDQ_D36@2/125-Ampres-Law_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[7]Example 12.6 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:zDDQ_D36@2/125-Ampres-Law_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[8]Example 12.8 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:zDDQ_D36@2/125-Ampres-Law_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[9]Example 12.8 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:zDDQ_D36@2/125-Ampres-Law_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[10]Example 12.9 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:Xx_lDtUL@2/126-Solenoids-and-Toroids_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310

[11]Example 12.10 from OpenStax University Physics2: https://cnx.org/contents/eg-XcBxE@9.7:_FueUvPK@4/127-Magnetism-in-Matter_1 placed in Public Domain by Guy Vandegrift: https://en.wikiversity.org/wiki/special:permalink/1892310