

Magnetic field of a wire carrying current

The following questions are due on the day we do the experiment. No credit after.

READ/STUDY IN YOUR TEXT SECTIONS 27-1, 27-2 FIGURE 27-8 AND SECTION 28-1 WITH ITS FIGURES, also the beginning of the experimental write up given to you.

Questions

1. To determine the direction of the field around a wire we use a rule known as the?
2. Explain the rule in question 1?

3. The magnetic field strength, B at a distance of, r , from a wire carrying a current I is given by the formula

4. The constant in the equation in question 3 is symbolized the Greek letter called ?
5. The constant referred above is called the?
6. What is the units of the magnetic field B ?
7. What is the units of the constant in the equation in question 3?

Problems: to be handed in with your lab report at its end. Show all work including formulas and math used.

P1. What is the magnetic field strength at 20 cm from a wire carrying a current of 8 A?. Be careful to use the proper units in the calculation.

P2. Assuming you are measuring B at 10 cm from a wire for varies currents I . A graph of the data produces a straight line.

What is the formula for the slope of this line($y=mx$) ie here. $B = \text{slope } I$ is a straight line.

P3. From knowing the value of the slope of the line in P2 is 1.95×10^{-6} at the distance of 10 cm what is the value of the constant in the equation being referred to in this exercise that comes from the slope?

P4. Calculate the % difference of constant calculated in P3 from the known value?