# Part 1 - Magnetic Field around a straight wire

## procedure and goal

We set up a power source, ammeter, and straight wire in series. We had a probe which could measure the magnetic field at any point in space.We completed two different experiments. In the first experiment we measured the magnetic field around the straight wire with a fixed distance but varying current. In the second experiment we measured the magnetic field around the straight wire with a fixed current but varying distance.

## results

Table 1: With a fixed distance

| I(amperes) | B(Gauss) |
|---|---|
| 0.00 | .041 |
| 1.00 | .168 |
| 1.23 | .217 |
| 1.51 | .254 |
| 2.03 | .320 |
| 2.23 | .336 |
| 2.60 | .369 |

Table 2: With fixed current

| N(turns) | B(Gauss) | 1/B(Gauss) |
|---|---|---|
| 0 | .318 | 3.144 |
| 2 | .296 | 3.37 |
| 4 | .283 | 3.53 |
| 6 | .244 | 4.09 |
| 8 | .223 | 4.48 |
| 10 | .211 | 4.73 |
| 12 | .188 | 5.31 |

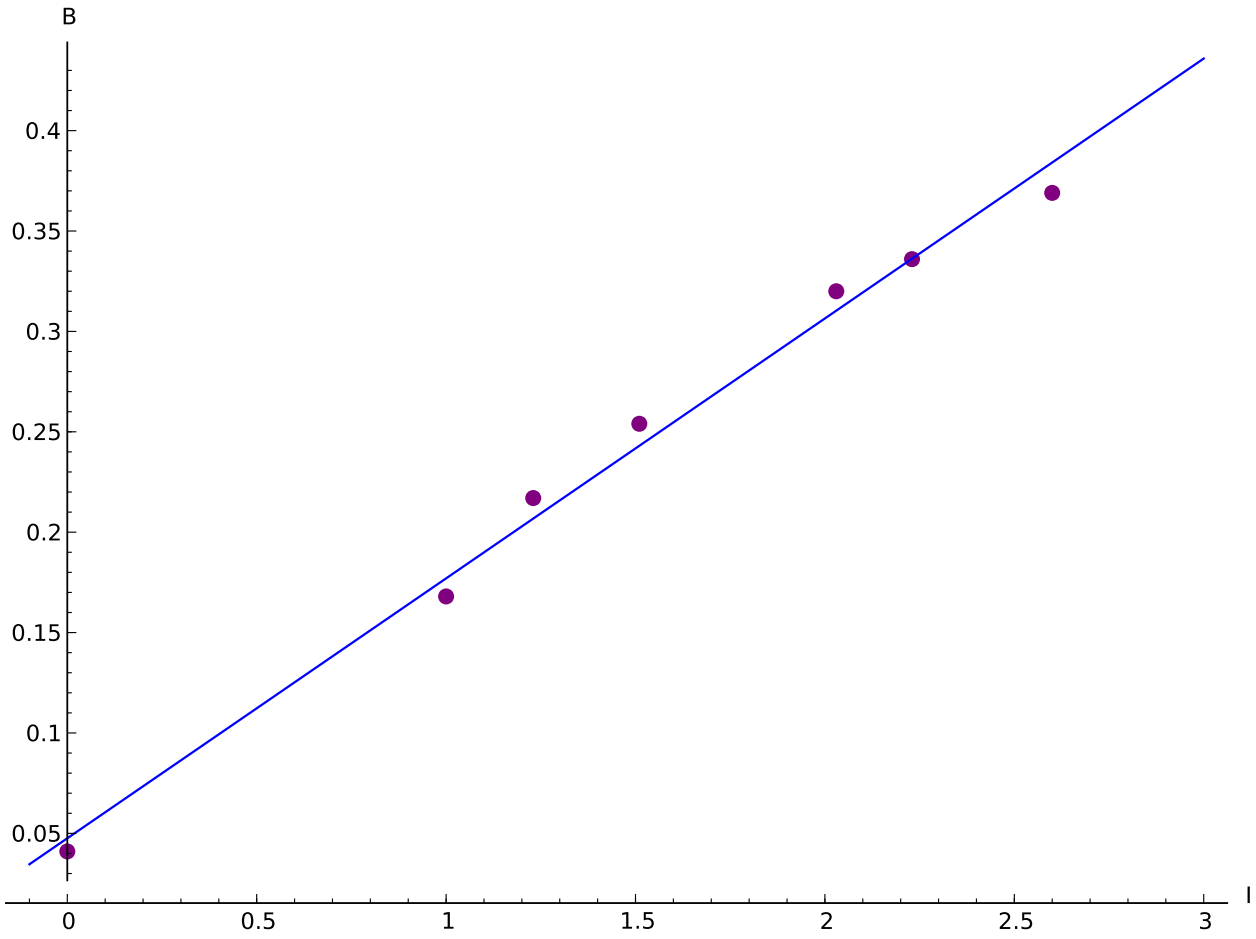


table 1 data: $I$ vs $B$. Best fit line is $B = .129I + .047$

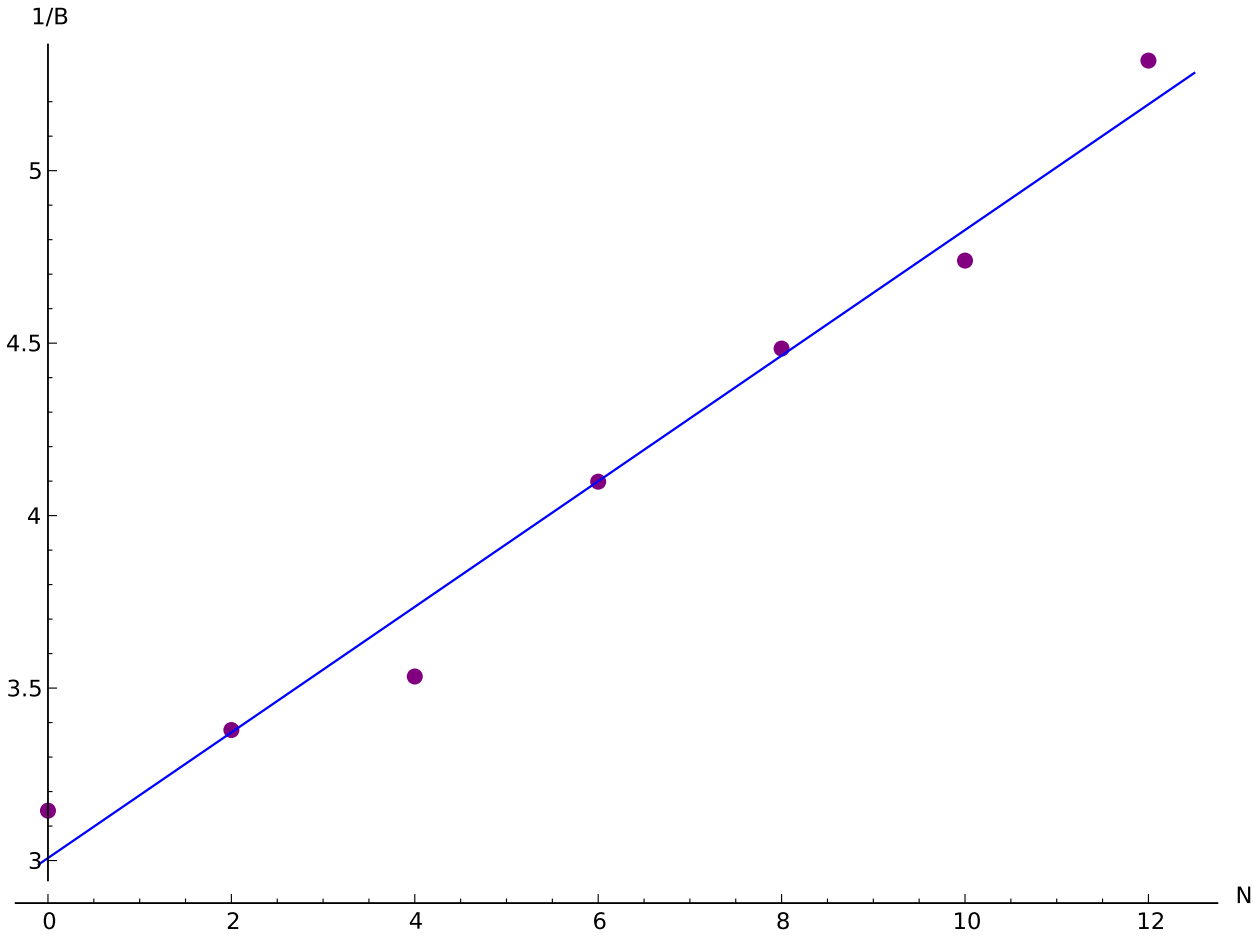


table 2 data: $N$ vs $\frac{1}{B}$. Best fit Line is $\frac{1}{B} = .18N + 3$

### analysis

## part 2 - Magnetic Field around Magnet

### procedure and goal

### results

Table 3

| D(cm) | B(Gauss) | 1/B(Gauss) |
|---|---|---|
| 2.5 | 1.41 | .709 |
| 3.5 | 1.21 | .826 |
| 4.5 | .914 | 1.09 |
| 5.5 | .274 | 3.64 |
| 6.5 | .07 | 14.28 |

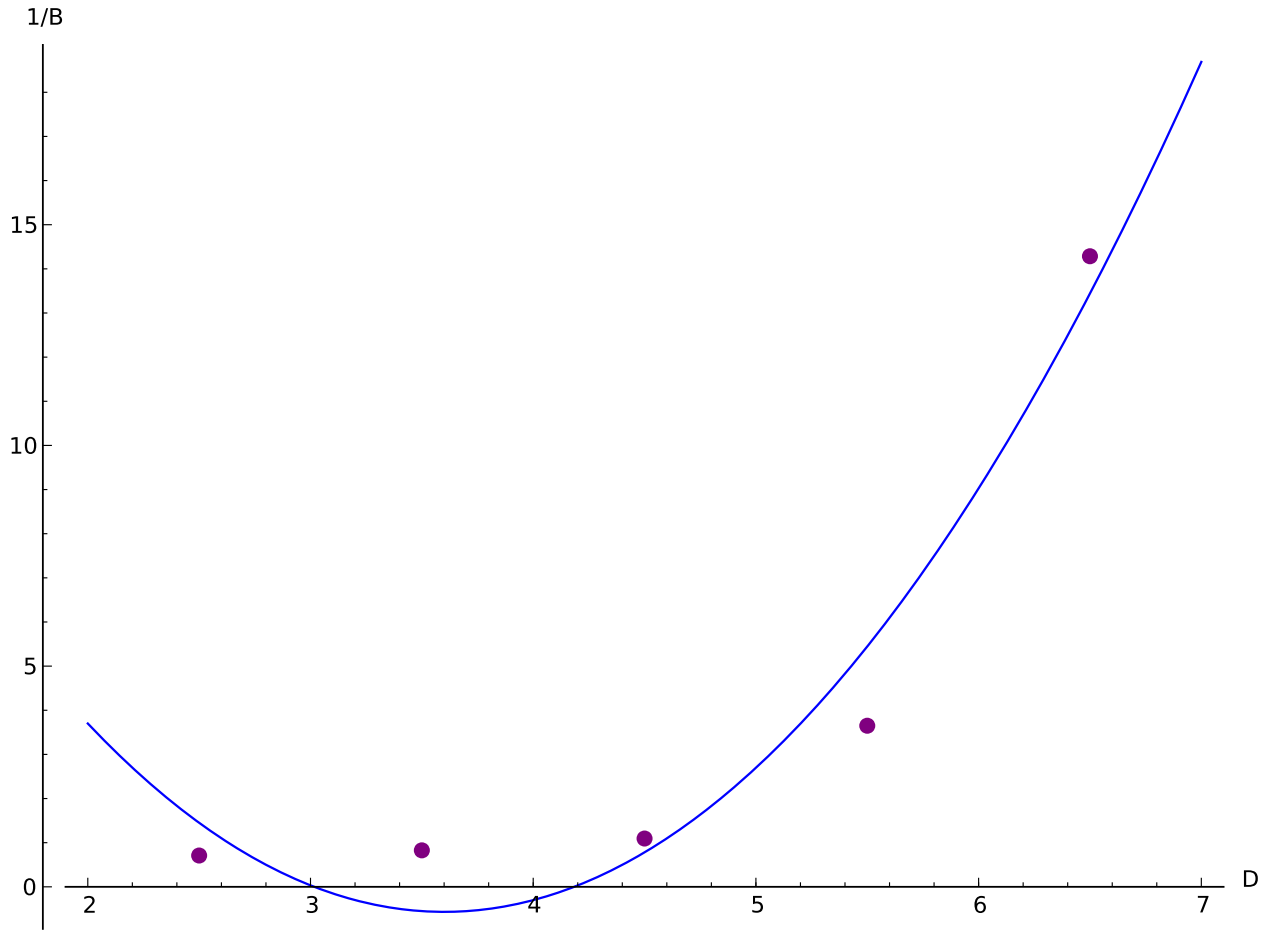


table 3 data: $D$ vs $\frac{1}{B}$. Best fit quadratic was $\frac{1}{B} = 1.66D^2 - 11.99D + 21.03$

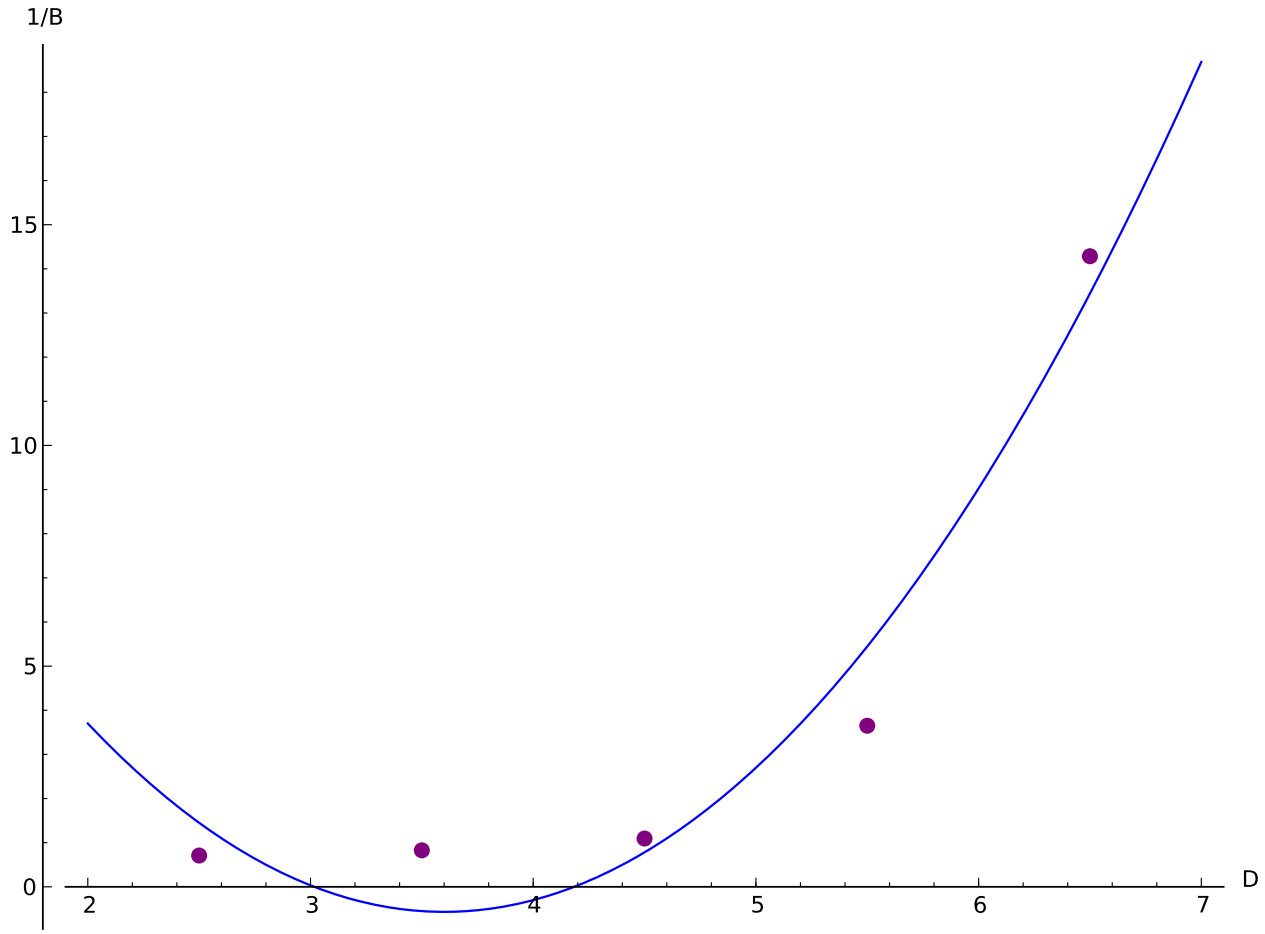


table 3 data: $D$ vs $\frac{1}{B}$. Best fit cubic was $\frac{1}{B} = .066D^3 - 7.25D^2 + 25.9D - 29.07$

**analysis**