

Name: _____ Date: _____ Class: _____

Proportional Magnetic Field Equations Handout

The magnetic field is related to the distance away from the center of the magnet by:

$$B = aX^n$$

We are using the proportional magnetic field determined by the tangent of the deflected angle:

$$B \propto \tan \theta$$

And the distance to the center of the magnet is from our measurements:

$$X = d$$

This power equation becomes:

$$\tan \theta = ad^n$$

Linearize by taking the log of both sides:

$$\mathbf{\log(\tan \theta) = \log(ad^n)}$$

Logarithmic rules make this a linear function.

$$\log(\tan \theta) = \log(a) + n \log(d)$$