Problem 29.6

The force on a charge moving through a magnetic field with velocity "v" is:

$$\vec{F} = q\vec{v}x\vec{B}$$

The magnitude of the force is:

$$\left|\vec{F}\right| = q\left|\vec{v}\right|\left|\vec{B}\right|\sin\theta$$

This suggests that:

$$\left|\vec{F}\right| \quad = \quad q \quad\quad \left|\vec{v}\right| \quad\quad \left|\vec{B}\right| \quad \sin\theta$$

$$\left(8.2x10^{-13}\ N\right) = \left(1.6x10^{-19}\ C\right)\left(4x10^{6}\ m/s\right)\left(1.7\ T\right)\sin\theta$$

$$\Rightarrow \quad \theta = \sin^{-1}\left(.753676\right)$$

$$= 48.9^{o}$$