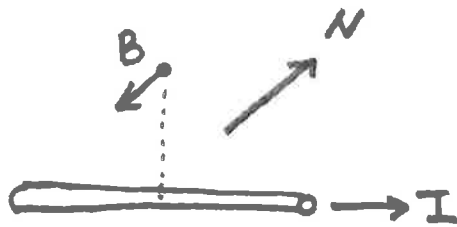


EX 7.1



a) Since $B = \frac{\mu_0 I}{2\pi r}$

$$I = \frac{2\pi r B}{\mu_0} = \frac{(2\pi)(0.01\text{m})(100\text{milli-gauss})}{4\pi \times 10^{-7}}$$

$$= \boxed{5\text{amperes}}$$

b) In Milwaukee, the magnetic field is pointed at 70° downward (from the horizontal) and has a strength of $56\mu\text{Tesla}$ (from www.ngdc.noaa.gov)

So I need to put my compass at a location $\boxed{\text{north of the wire}}$ and $\boxed{20^\circ \text{ above the horizontal}}$



so it can cancel Earth's field.

$$56\mu\text{T} = \frac{\mu_0 (5\text{amps})}{2\pi r}$$



$$\boxed{r = 1.8\text{cm}}$$