Ch.12 Prob.50

$n = 12 \text{ turns/cm}$

$B = 2.0 \times 10^{-2} T$

Solenoid

The magnetic field in a solenoid goes as the formula

$$B = \mu_0 n I$$

where 'n' is the # turns / meter

converting units n is

$$n = \frac{12 \text{ turns}}{\text{cm}} \left(\frac{100 \text{ cm}}{1 \text{ m}}\right) = \frac{1200 \text{ turns}}{\text{m}}$$

Now solve for current, I

$$I = \frac{B}{\mu_0 n} = \frac{2.0 \times 10^{-2} T}{\left(4\pi \times 10^{-7} \frac{Tm}{A}\right)\left(1200 \frac{\text{turns}}{\text{m}}\right)}$$

$$\boxed{I = 13.3 \text{ A}}$$