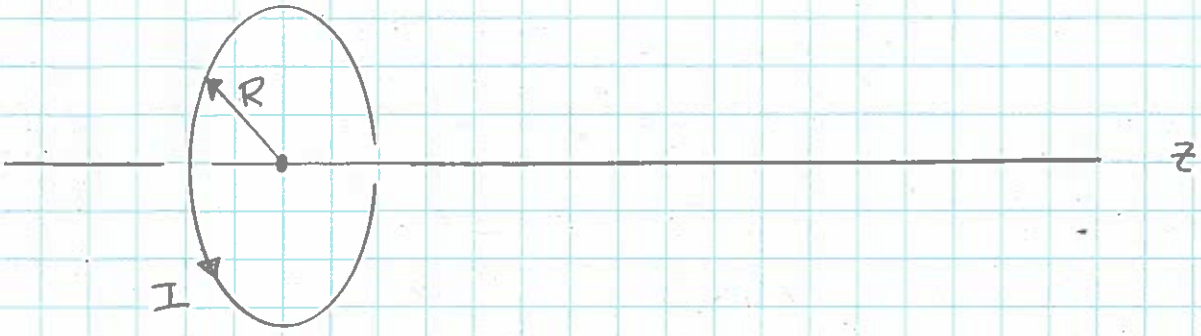

On axis magnetic field, $B = \frac{\mu_0}{2} \frac{IR^2}{(z^2+R^2)^{3/2}}$

for $z=0$: $B(0) = \frac{\mu_0 I}{2R}$

So for $B(z) = \frac{1}{2} B(0)$

$$\frac{\mu_0}{2} \frac{IR^2}{(z^2+R^2)^{3/2}} = \frac{1}{2}\left(\frac{\mu_0 I}{2R}\right)$$

or,

$$\frac{R^2}{(z^2+R^2)^{3/2}} = \frac{1}{2R}$$

$$2R^3 = (z^2+R^2)^{3/2}$$

or,

$$(2R^3)^{2/3} = z^2+R^2$$

So: $$\frac{z^2}{R^2} + 1 = 2^{2/3}$$

and $$\frac{z}{R} = \sqrt{2^{2/3}-1} = 0.766$$

or, $$z = 0.766R$$