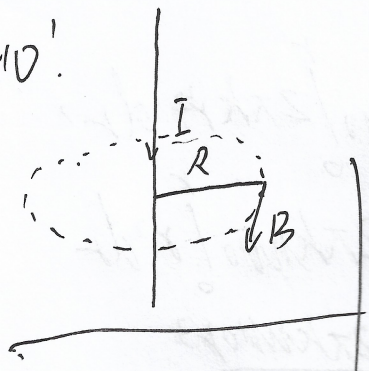
ДЗ 9

1. а) Дано:



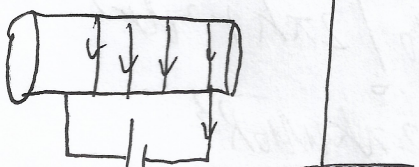
$B(r) - ?$

$$\oint_l \vec{B}(r)\,d\vec{l} = \mu\mu_0 I$$

$$B(r)\cdot 2\pi R = \mu\mu_0 I$$

$$B(r) = \frac{\mu\mu_0 I}{2\pi R}$$

б) Дано: I, N, l



$B - ?$

$$\oint \vec{B}\,d\vec{l} = \mu\mu_0 N I$$

$$B \cdot l = \mu\mu_0 N I$$

$$B = \frac{\mu\mu_0 N I}{l}$$

2. Дано: R, j

$B(r) - ?$

① $r < R$

$$\oint_l \vec{B}(r)\,d\vec{l} = \mu\mu_0 \int_0^r j \cdot 2\pi r'\,dr$$

$$B(r)\cdot 2\pi r = j\mu\mu_0 \pi r^2$$

$$B(r) = \frac{\mu\mu_0 j r}{2}$$

② $r > R$

$$\oint_1 \vec{B}(r)\,d\vec{l} = \mu\mu_0 \int_0^R j 2\pi r\,dr$$

$$B(r)\cdot 2\pi r = \mu\mu_0 j \pi R^2$$

$$B(r) = \frac{\mu\mu_0 j R^2}{2r}$$