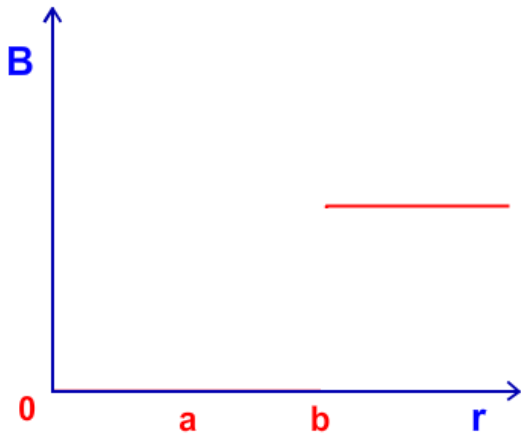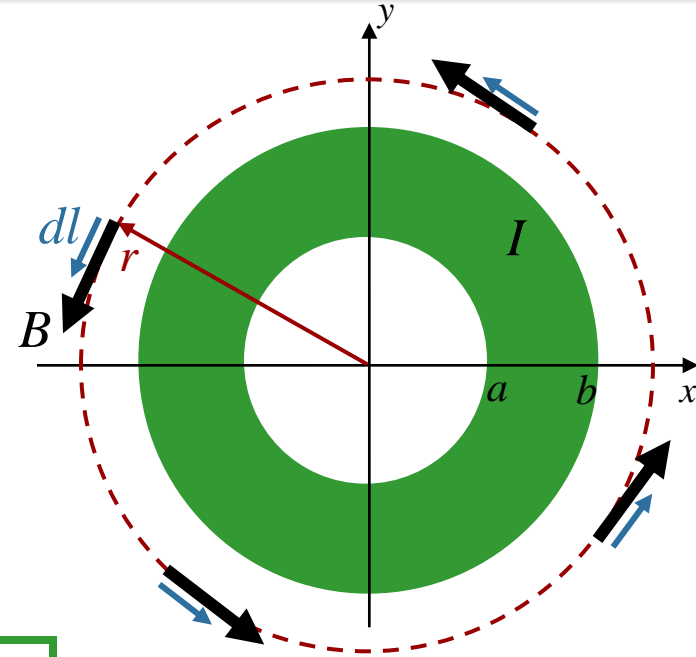What does $|B|$ look like for $r > b$?
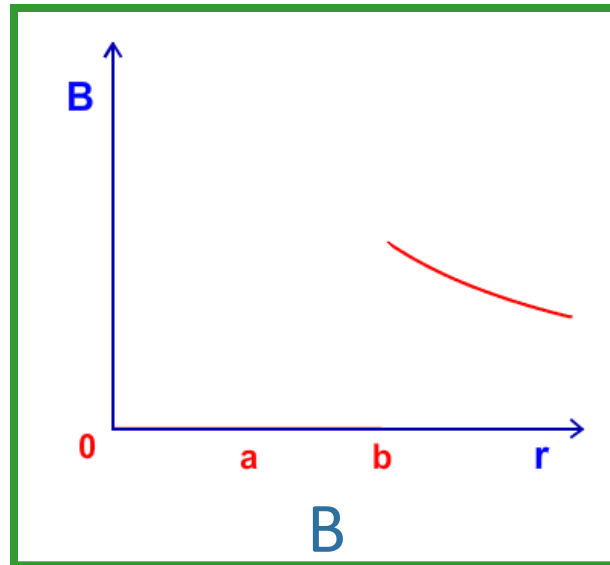
LHS: $$\oint \vec{B} \bullet d\vec{\ell} = \oint B d\ell = B \oint d\ell = B \cdot 2\pi r$$
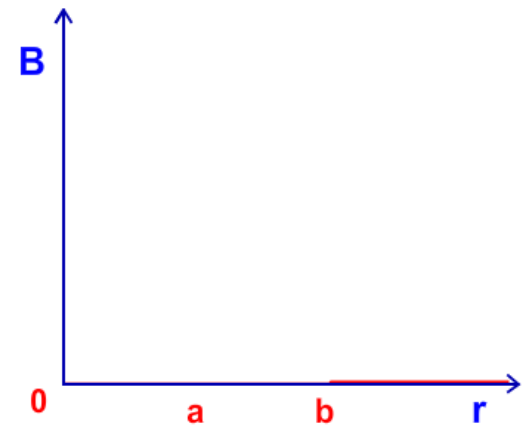
RHS: $$I_{enclosed} = I$$

$$\longrightarrow \quad B = \frac{\mu_o I}{2\pi r}$$

A

B

C