1. Magnetfeld eines asymmetrischen Leiters

a) $r = \sqrt{x^2 + y^2}$

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\begin{aligned}
I_+ &= I(1 + \tfrac{a^2}{R^2}) \\
I_- &= -I \tfrac{a^2}{R^2} \\
B_+ &= \tfrac{\mu_0 I_+}{2r\pi} = \tfrac{\mu_0 I_+}{2\pi\sqrt{x^2+y^2}} \\
B_- &= \tfrac{\mu_0 I_-}{2r\pi} = \tfrac{\mu_0 I_-}{2\pi\sqrt{(x-b)^2+y^2}} \\
B &= B_+ + B_- = \tfrac{\mu_0 I_+}{2\pi\sqrt{x^2+y^2}} + \tfrac{\mu_0 I_-}{2\pi\sqrt{(x-b)^2+y^2}} = \\
&= \tfrac{\mu_0 I}{2\pi}\left[\tfrac{1}{\sqrt{x^2+y^2}} + \tfrac{a^2}{R^2}\left(\tfrac{1}{\sqrt{x^2+y^2}} - \tfrac{1}{\sqrt{(x-b)^2+y^2}}\right)\right] \\
B(2R,0) &= \underline{\underline{\tfrac{\mu_0 I}{4R\pi}\left[1 + \tfrac{a^2}{R}\left(\tfrac{1}{R} - \tfrac{1}{R-b}\right)\right]}}
\end{aligned}
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b)

$$
B(0,2R) = \underline{\underline{\tfrac{\mu_0 I}{2R\pi}\left[\tfrac{1}{2} + \tfrac{a^2}{R}\left(\tfrac{1}{2R} - \tfrac{1}{\sqrt{b^2+4R^2}}\right)\right]}}
$$