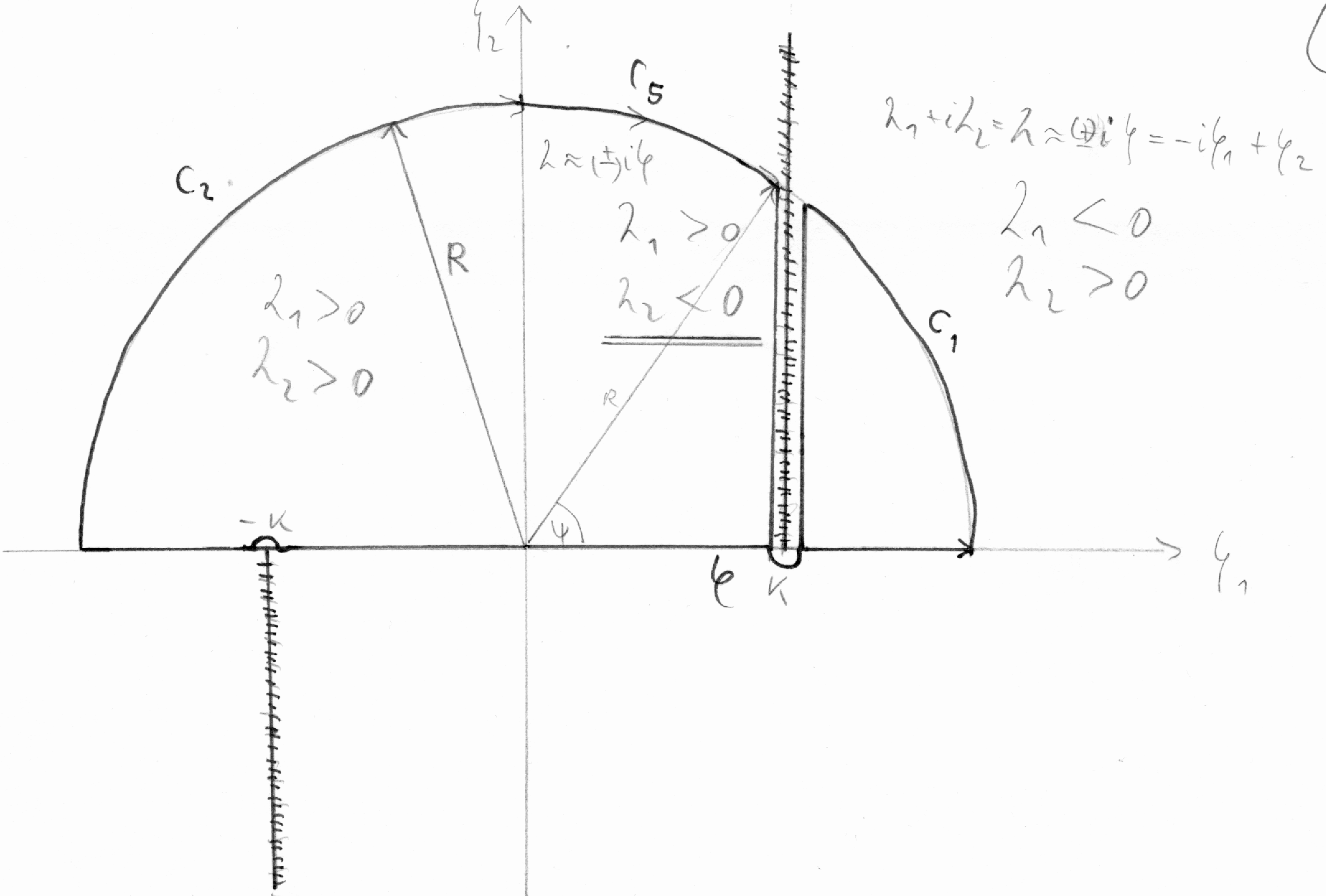

$$G_m = \int_{\ell} dq\, e^{iqz} J_m(\lambda r_<)\, H_m^{(1)}(\lambda r_>)$$

$$\approx \int_{\ell} dq\, e^{iqz} \left[e^{i\lambda(r_< - r_>)} + e^{i\lambda(r_> + r_<)}\, e^{-i(m+\frac{1}{2})\pi} \right] \frac{1}{\pi\sqrt{r_< r_>}}$$

$z>0$: $\quad q = R e^{i\psi}, \quad e^{iqz} = e^{-zR\sin\psi} e^{izR\cos\psi}; \qquad z\sin\psi \geq 0: C_2, C_5, C_1$

C_1: $\quad \lambda = \sqrt{\kappa^2 - q^2} \Rightarrow \lambda \approx \substack{+\\(-)} i q$, wenn $|q| = R >> \kappa \quad | \quad dq = iRe^{i\psi} d\psi$

$\lambda \approx \substack{+\\(-)} i q_1 (\mp) q_2 = +iR\sin\psi - R\cos\psi$

C_5: $\quad \Rightarrow \lambda \approx (\mp) i q = (\pm) i q_1 (\mp) q_2 = \lambda_1 + i\lambda_2 = iR\cos\psi + R\sin\psi$

$$J = \int_{C_5} dq\, e^{iqz} \left[e^{i\lambda(r_> + r_<)} \right] \frac{1}{\pi\sqrt{r_< r_>}}$$

$$|J| \leq R \int_{\psi=\pi/2}^{\psi=\arccos(\kappa/R)} d\psi\; e^{-zR\sin\psi} \underbrace{\left|e^{izR\cos\psi}\right|}_{1}\; e^{+(r_> + r_<)R\sin\psi} \underbrace{\left|e^{i(r_> + r_<)R\cos\psi}\right|}_{1}$$