$$\gamma(t) = \frac{\gamma_1(t) - w}{\gamma_2(t) - w} \qquad \gamma'(t) = \frac{\gamma_1'(t)(\gamma_2(t) - w) - (\gamma_1(t) - w)\cdot\gamma_2'(t)}{(\gamma_2(t) - w)^2}$$

-, rozbijamy...

$$0 = \operatorname{Ind}_\gamma(0) = \frac{1}{2\pi i}\int_\gamma \frac{1}{z-0}\,dz = \frac{1}{2\pi i}\int_0^1 \frac{1}{\frac{\gamma_1(t) - w}{\gamma_2(t) - w}} \cdot \frac{\gamma_1'(t)(\gamma_2(t) - w) - (\gamma_1(t) - w)\gamma_2'(t)}{(\gamma_2(t) - w)^2}\,dt$$

$$= \frac{1}{2\pi i}\int_0^1 \frac{1}{\gamma_1(t) - w}\gamma_1'(t)\,dt - \frac{1}{2\pi i}\int_0^1 \frac{\gamma_2'(t)}{\gamma_2(t) - w}\,dt = \underbrace{\frac{1}{2\pi i}\int_{\gamma_1} \frac{1}{z-w}\,dz - \frac{1}{2\pi i}\int_{\gamma_2} \frac{dz}{z-w}}$$

$$= \operatorname{Ind}_{\gamma_1}(w) - \operatorname{Ind}_{\gamma_2}(w).$$