

$$\gamma(t) = \frac{\gamma_1(t) - w}{\gamma_2(t) - w}$$

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

$$0 = \text{Ind}_\gamma(0) = \frac{1}{2\pi i} \int_\gamma \frac{1}{z - 0} dz = \frac{1}{2\pi i} \int_0^1 \frac{1}{\underbrace{\gamma_1(t) - w}_{\text{green}} \underbrace{\gamma_2(t) - w}_{\text{orange}}} dt$$

-, wozu? amy...

$$\frac{\gamma_1'(t) \underbrace{(\gamma_2(t) - w)}_{\text{orange}} - \underbrace{(\gamma_1(t) - w)}_{\text{green}} \gamma_2'(t)}{\underbrace{(\gamma_2(t) - w)^2}_{\text{orange}}} dt$$

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

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