

# rechnung\_umkehrintegrator

## Student Group

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$U_A = f(U_E)$	mit III.	
$\frac{d}{dt} U_A = f(U_E)$		
$U_A = \frac{1}{C} U_D - U_C$	mit II. und I.	$U_D = \frac{1}{A} \frac{d}{dt} U_A \overset{A_D}{\rightarrow} \infty \rightarrow 0$
$\frac{d}{dt} U_A = \frac{1}{C} \frac{d}{dt} U_D - \frac{d}{dt} U_C$		
$U_A = 0 - \frac{1}{C} U_C$	mit V.	$U_C = \frac{1}{C} \int_{t_0}^{t_1} I_C dt + Q_0(t_0)$
$\frac{d}{dt} U_A = -\frac{1}{C} \frac{d}{dt} U_C$		
$U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_C dt + Q_0(t_0)$	mit IV.	$I_C = I_R$
$\frac{d}{dt} U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_C dt + Q_0(t_0)$		
$U_A = \frac{1}{C} \int_{t_0}^{t_1} I_R dt + Q_0(t_0)$	Ausklammern	
$\frac{d}{dt} U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_R dt + Q_0(t_0)$		
$U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_R dt - \frac{Q_0(t_0)}{C}$	Integrationskonstante betrachten	$\frac{Q_0(t_0)}{C} = U_C(t_0) = -U_{A0}$
$\frac{d}{dt} U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_R dt + U_{A0}$		
$U_A = -\frac{1}{C} \int_{t_0}^{t_1} I_R dt + U_{A0}$	mit VI. und II.	$I_R = \frac{U_R}{R} = \frac{U_E}{R}$
$\frac{d}{dt} U_A = -\frac{1}{C} \int_{t_0}^{t_1} \frac{U_E}{R} dt + U_{A0}$		
$U_A = -\frac{1}{C} \int_{t_0}^{t_1} \frac{U_E}{R} dt + U_{A0}$	Konstante vorziehen	
$\frac{d}{dt} U_A = -\frac{1}{R} \int_{t_0}^{t_1} U_E dt + U_{A0}$		
$U_A = -\frac{1}{R} \int_{t_0}^{t_1} U_E dt + U_{A0}$	Zeitkonstante $\tau = R \cdot C$ einfügen	
$\frac{d}{dt} U_A = -\frac{1}{\tau} \int_{t_0}^{t_1} U_E dt + U_{A0}$		
$U_A = -\frac{1}{\tau} \int_{t_0}^{t_1} U_E dt + U_{A0}$		

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