

rechnung_umkehrintegrator

Student Group

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Table of Contents

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

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