

rechnung_signalzeitverlauf_umkehrintegrator

Student Group

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\$I.\quad\$ Am Punkt \$t_1\$

$$U_A(t_1) = -\frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_E \, dt + U_A(t_0)$$

$$U_A(t_1) = -\frac{1}{5 \text{ k}\Omega \cdot 1 \text{ }\mu\text{F}} \cdot \int_0^{10 \text{ ms}} 1 \text{ V} \, dt + 0 \text{ V}$$

$$U_A(t_1) = -\frac{1}{5 \text{ ms}} \cdot \int_0^{10 \text{ ms}} 1 \text{ V} \, dt$$

$$U_A(t_1) = -\frac{1}{5 \text{ ms}} \cdot 1 \text{ V} \cdot [t]_0^{10 \text{ ms}} = -2 \text{ V}$$

\$I.\quad\$ Am Punkt \$t_2\$

$$U_A(t_1) = -\frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_E \, dt + U_A(t_0)$$

$$U_A(t_1) = -\frac{1}{5 \text{ ms}} \cdot \int_{10 \text{ ms}}^{20 \text{ ms}} (-1 \text{ V}) \, dt + 0 \text{ V} = 0 \text{ V}$$

\$I.\quad\$ Am Punkt \$t_3\$

$$U_A(t_1) = -\frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_E \, dt + U_A(t_0)$$

$$U_A(t_1) = -\frac{1}{5 \text{ ms}} \cdot \int_{10 \text{ ms}}^{20 \text{ ms}} (-2 \text{ V}) \, dt + 0 \text{ V} = -2 \text{ V}$$

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