

# rechnung\_signalzeitverlauf\_umkehrintegrator

## Student Group

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\$l.\quad\$ At the point \$t\_1\$

$U_{\text{O}}(t_1) = \frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_{\text{I}} \text{d}t + U_{\text{O}}(t_0)$	
$U_{\text{O}}(t_1) = -\frac{1}{5 \text{ ms}} \cdot 1 \text{ V} \cdot \int_0^{10 \text{ ms}} 1 \text{ V} \text{d}t + 0 \text{ V}$	
$U_{\text{O}}(t_1) = -\frac{1}{5 \text{ ms}} \cdot 1 \text{ V} \cdot 10 \text{ ms} + 0 \text{ V} = -2 \text{ V}$	

\$l.\quad\$ At the point \$t\_2\$

$U_{\text{O}}(t_1) = \frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_{\text{I}} \text{d}t + U_{\text{O}}(t_0)$	
$U_{\text{O}}(t_1) = -\frac{1}{5 \text{ ms}} \cdot (-1 \text{ V}) \cdot \int_{10 \text{ ms}}^{20 \text{ ms}} 1 \text{ V} \text{d}t + 0 \text{ V} = 0 \text{ V}$	

\$l.\quad\$ At the point \$t\_3\$

$U_{\text{O}}(t_1) = \frac{1}{\tau} \cdot \int_{t_0}^{t_1} U_{\text{I}} \text{d}t + U_{\text{O}}(t_0)$	
$U_{\text{O}}(t_1) = -\frac{1}{5 \text{ ms}} \cdot (-2 \text{ V}) \cdot \int_{10 \text{ ms}}^{20 \text{ ms}} 1 \text{ V} \text{d}t + 0 \text{ V} = -2 \text{ V}$	

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