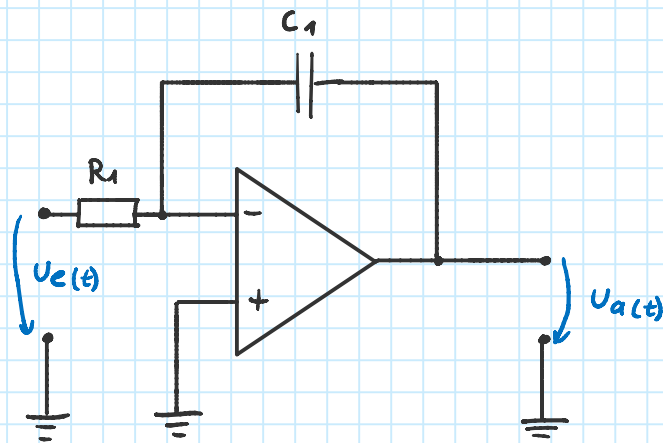


18.12.2019

Mittwoch, 18. Dezember 2019 18:43



$$R_1 = 2 \text{ k}\Omega$$

$$C_1 = 25 \mu\text{F}$$

$$U_e(t) = 2,5 \text{ V} \cdot \sin\left(100 \frac{t}{\text{s}} + 40^\circ\right)$$

$$U_a(t) = \hat{U}_a \cdot \sin(\omega t + \varphi_a)$$

$$\hat{U}_a = ?$$

$$\varphi_a = ?$$

Schaltungstyp: Integrierer

$$\Rightarrow U_a(t) = -\frac{1}{RC} \cdot \int U_e(t) dt$$

$$= -\frac{1}{RC} \cdot \int \hat{U}_e \cdot \sin(\omega t + \varphi_e) dt$$

$$= -\frac{\hat{U}_e}{RC} \cdot \int \sin(\omega t + \varphi_e) dt$$

$$= \ominus \frac{\hat{U}_e}{RC} \cdot (\ominus \cos(\omega t + \varphi_e)) \cdot \frac{1}{\omega}$$

$$= \frac{\hat{U}_e}{RC} \cdot \sin(\omega t + \varphi_e + 90^\circ) \cdot \frac{1}{\omega}$$

$$= \frac{2,5 \text{ V}}{2 \text{ k}\Omega \cdot 25 \mu\text{F}} \cdot \sin\left(100 \frac{t}{\text{s}} + 40^\circ + 90^\circ\right) \cdot \frac{1}{100 \text{ s}^{-1}}$$

$$= 0,5 \text{ V} \cdot \sin\left(100 \frac{t}{\text{s}} + 130^\circ\right)$$

$$\hat{U}_a = 0,5 \text{ V} \quad \varphi_a = 130^\circ \curvearrowright$$

$$\varphi_a = 50^\circ ?$$