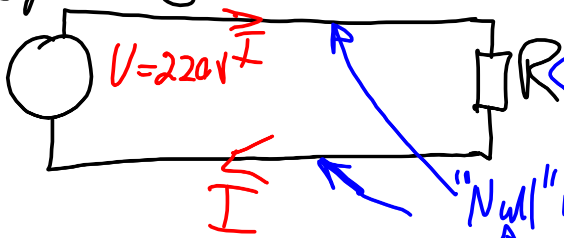
Spenningskilde

$R = 1000\,\Omega$



"Null" motstand

↑

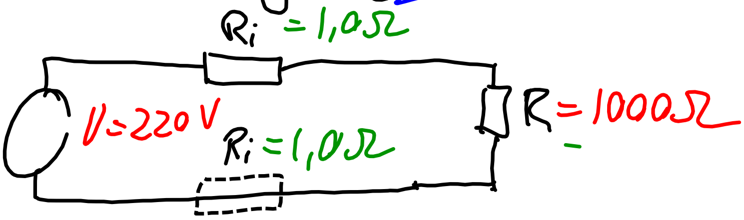
Veldig mye mindre enn R

$R_i \simeq < 1{,}0\,\Omega$

$$I = \frac{U}{R} = \frac{220\text{ V}}{1000\,\Omega} = 0{,}220\text{ A} = 220\text{ mA}$$

med R_i

Ekvivalentskjema ← Denne skal vi regne ut senere



$$I = \frac{U}{R_T} = \frac{220\text{V}}{R + R_i + R_i} = \frac{220\text{ V}}{(1000 + 2{,}0)\,\Omega} = \frac{220\text{ V}}{1002\,\Omega}$$

Hvordan regne ut den indre motstand i ledningen; R_i

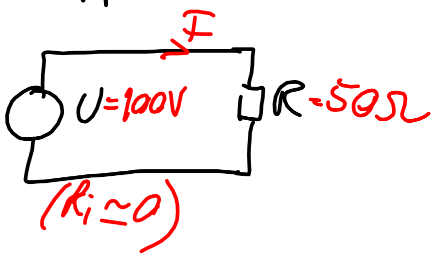
R_i bør være minst mulig for at ikke ledningen skal bli for varm

↳ Strømstyrken bestemmer det

"Bli for varm": (Eks med motstand)

Effekt: P_R

$I = \frac{U}{R} = \frac{100V}{50\Omega} = 2{,}0\ A$



$P_R = U \cdot I = 100V \cdot 2{,}0A = 200\ W$

↑ effekt, ↖ spenning, ↖ strøm

$\text{Energi} = P_R \cdot t$

Eks: $t = 10\ s$

$E = P_R \cdot t = 200[W] \cdot 10[s] = 2000[W \cdot s]$ → Joule

(symbol for varme-energi: Q; E ↗ Varme)

$Q = c \cdot m \cdot \Delta t$

- c: Spesifikk varmekapasitet (avhengig av materialet) ⇒ finnes i tabeller
- m: massen
- Δt: temp.økning

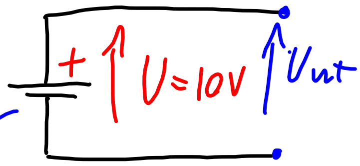
$\Delta t = \frac{Q}{c \cdot m} = \frac{2000[J]}{0{,}51\left[\frac{kJ}{kg \cdot K}\right] \cdot 0{,}1[kg]} = \frac{2{,}0[kJ]}{0{,}051\left[\frac{kJ}{kg \cdot K} \cdot kg\right]}$

$= 39{,}2[K]$

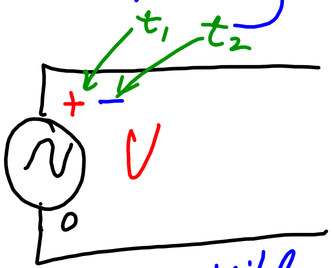
↑ Kelvin (temp)

Spenning U [V]

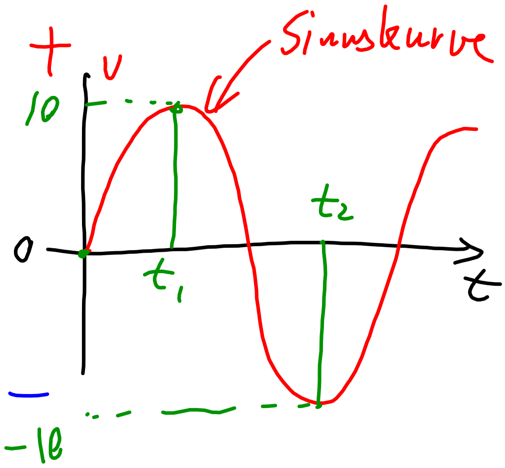
V ← symbol for spenning (i USA)



Spenningskilde
Likespenning



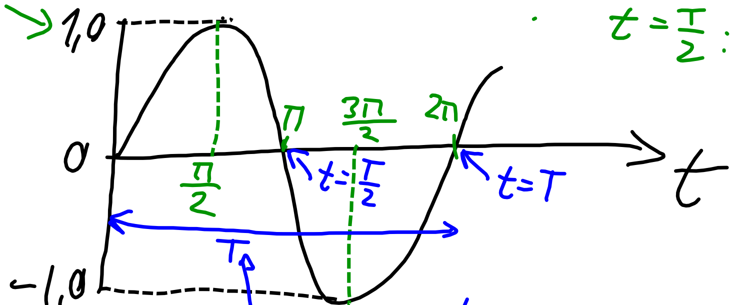
Spenningskilde
Vekselspenning



$u(t) = a \cdot \sin 2\pi f t = a \sin 2\pi \frac{t}{T}$

$t = T: a \cdot \sin 2\pi \frac{T}{T} = a \cdot \sin 2\pi$

$t = \frac{T}{2}: a \cdot \sin 2\pi \frac{\frac{T}{2}}{T} = a \cdot \sin \pi$

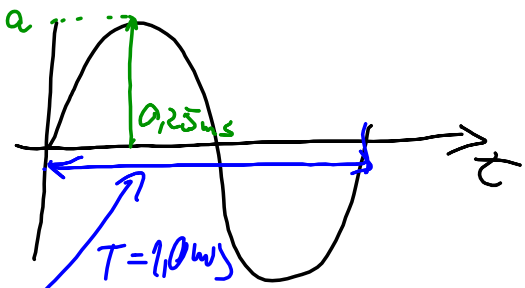


Periodetiden

$f = \frac{1}{T}$

$f = 1000\,Hz$

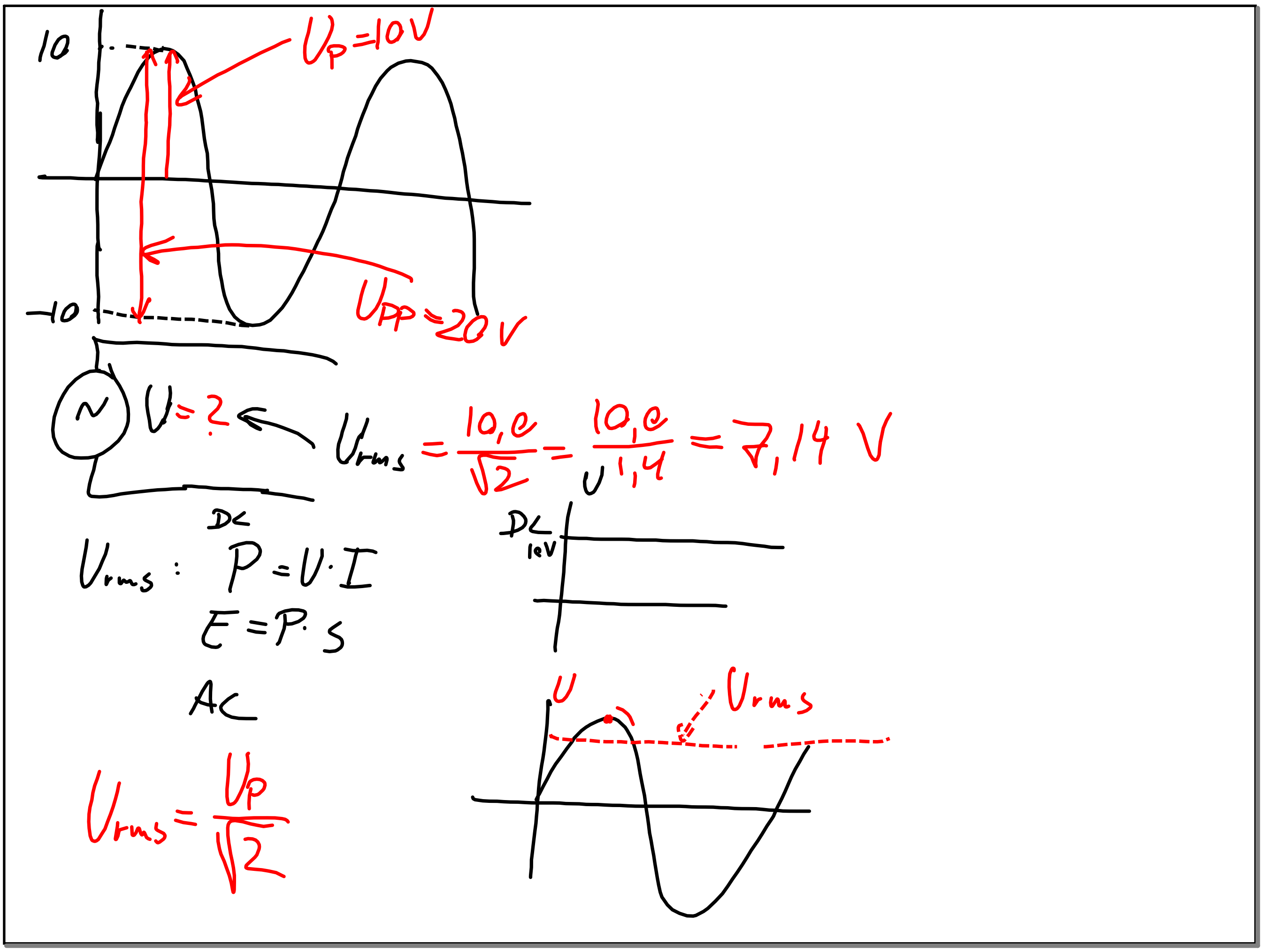
$T = \frac{1}{f} = \frac{1}{1000 [\frac{1}{s}]} = 0{,}001\,s = 1\,ms$



$u(t) = a \cdot \sin 2\pi 1000 \cdot 0{,}25$ [ms]

$= a \cdot \sin 2\pi \cdot 0{,}25 =$

$a \cdot \sin 2\pi \frac{1}{4} = a \cdot \sin \frac{\pi}{2}$


10
Up=10V
-10
Upp=20 V
U=?
Urms = 10,0/√2 = 10,0/1,4 = 7,14 V
DC
Urms : P = U·I
E = P·s
AC
Urms = Up/√2
DC
10V
U
Urms