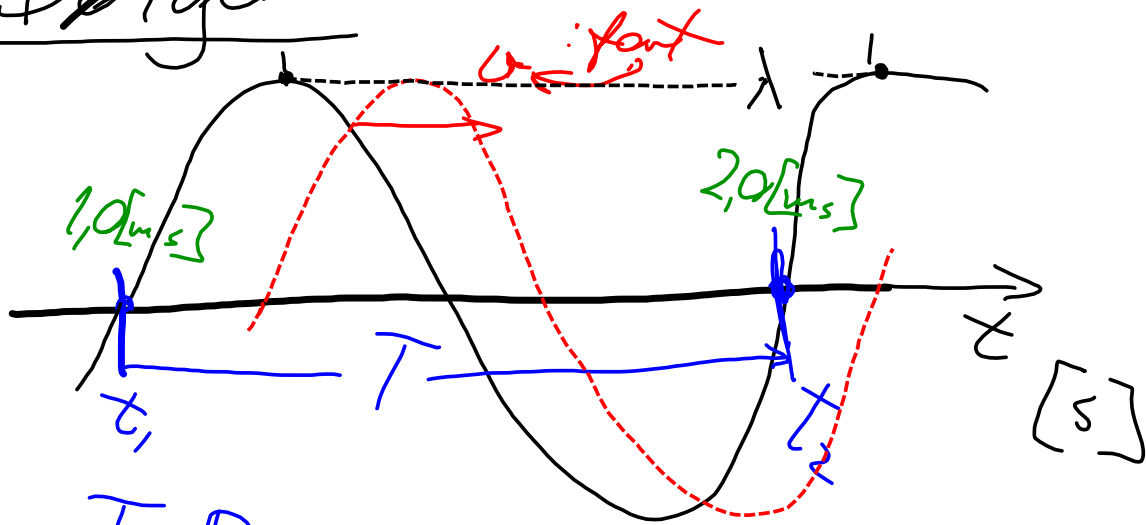


Bølger



T : Periodeid $T = t_2 - t_1$

$$T = (2,0 - 1,0) [\text{ms}] = 1,0 [\text{ms}]$$

v : Bølgefart

(Hvis) Lys: da er hastigheten

"lysets" hastighet

$$c = 3,00 \cdot 10^8 [\text{m/s}]$$

λ : Bølglengde [m]

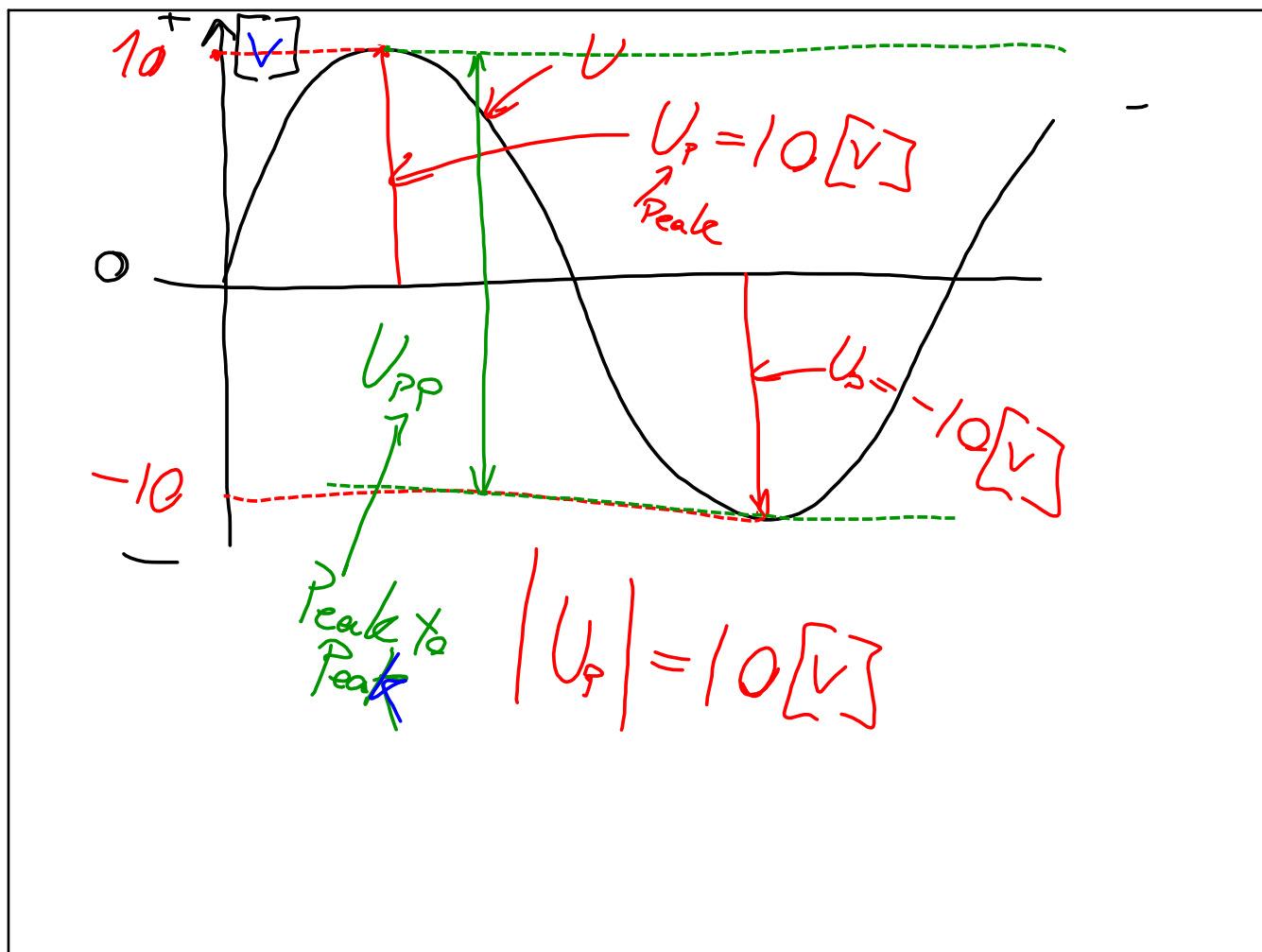
$$v = \frac{\lambda}{T}$$

f : frekvens

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

$$[f] = [\text{s}^{-1}]$$

$$[f] = \left[\frac{1}{\text{s}} \right]$$



$$v = \frac{\lambda}{T} = \lambda \cdot f \quad c = \lambda \cdot f = \frac{\lambda}{T}$$

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

Lysbølger, elektromagnetiske bølger
(eller andre bølger) går med
lysets hastighet:

Da brukes symbolet c
i stedet for v

$$c = \lambda \cdot f$$

$$3,0 \cdot 10^8 \text{ m/s} = \lambda \cdot f$$

← antenne
 bør være
 $\frac{\lambda}{4} = L$

$$f = 100 \text{ MHz} = 100 \cdot 10^6 \text{ Hz}$$

$$\lambda = \frac{c}{f} = \frac{3,0 \cdot 10^8 \text{ [m/s]}}{1,0 \cdot 10^8 \text{ [1/s]}} = 3,0 \text{ [m]}$$

$$L = \frac{\lambda}{4} = \frac{3,0}{4} \text{ [m]} = 0,75 \text{ [m]}$$

9.02

20 svingninger på 15 sek

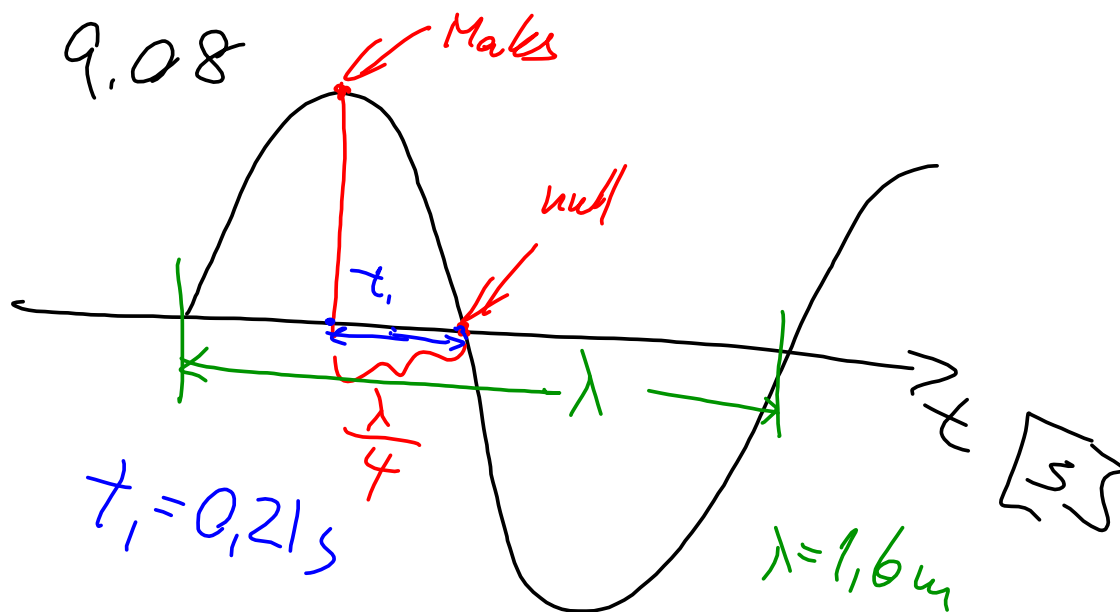
$$\text{En svingning: } T = \frac{15[s]}{20} = 0,75[s]$$

$$f = \frac{1}{T} = \frac{1}{0,75[s]} = 1,33\left[\frac{1}{s}\right] = 1,33[\text{Hz}]$$

9.03

$$f = 0,2[\text{Hz}]$$

$$T = \frac{1}{f} = \frac{1}{0,2\left[\frac{1}{s}\right]} = 5,0[s]$$



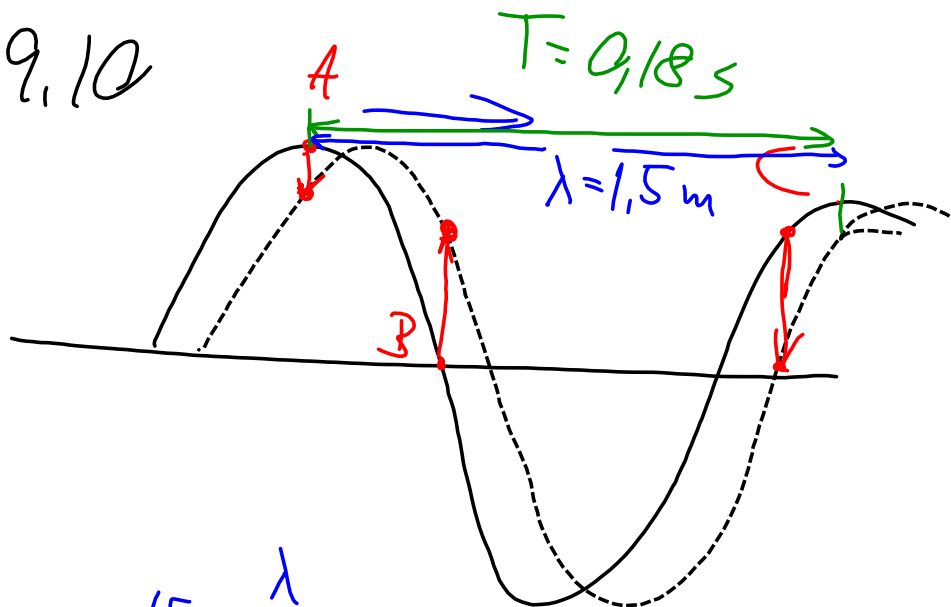
$$T = 0,21 [s] \cdot 4 = 0,84 [s]$$

↑
Perioden

$$f = \frac{1}{T} = \frac{1}{0,84 [s]} = 1,2 [Hz]$$

$$v = f \cdot \lambda = 1,2 \left[\frac{1}{s} \right] \cdot 1,6 [m] = 1,9 \left[\frac{m}{s} \right]$$

9,10



$$v = \frac{\lambda}{T} = \frac{1,5 \text{ [m]}}{0,18 \text{ [s]}} = 8,3 \text{ m/s}$$

9,11

$$f = 600 \text{ [Hz]} = 600 \cdot 10^{12} \text{ [1/s]}$$

$$c = f \cdot \lambda$$

$$\lambda = \frac{c}{f} = \frac{3,00 \cdot 10^8 \text{ [m/s]}}{6,00 \cdot 10^{14} \text{ [1/s]}} = 0,2 \cdot 10^{8-14} \text{ [m]}$$

$$0,2 \cdot 10^{-6} \text{ m} = 200 \cdot 10^{-9} \text{ [m]} = 200 \text{ [nm]}$$