1)

$$\text{itensitet } I \text{ i } dB = 10 \log_{10} \left(\frac{I}{I_0} \right)$$

$$\text{generelt} \quad \log (a \cdot 10^b) = \log (a) + \log (10^b)$$

$$= \log (a) + b$$

$$\text{så} \quad 10 \log \left(\frac{I}{I_0} \right) + X = 10 \log \left(\frac{I}{I_0} \cdot 10^x \right)$$

2a)

$$f_G = 196.1 \text{ Hz}$$
$$f_C = 261.7 \text{ Hz}$$
$$L_G = 0.65m$$
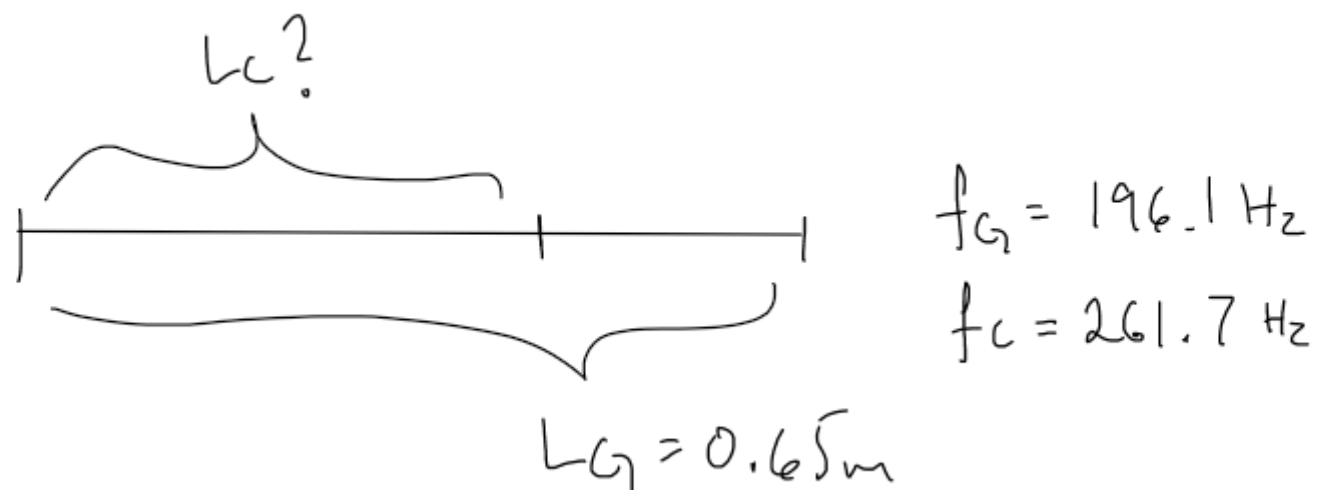
bruker formel

$$f = \frac{v}{2L}, \quad v = f 2L = 196.1 \text{ Hz} \cdot 2 \cdot 0.65m = 254.93 \, m/s$$
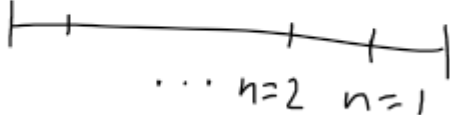
$$\text{da er } L_C = \frac{v}{2 f_C} = 0.487m$$

2b)
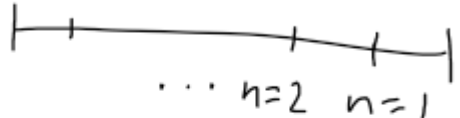
Avstanded mellom båndene blir mindre når n blir større.

$$f_n = \text{frekvensen til fret } \#n$$

$$L_n = \text{Posisjonen } - \text{"} - $$

$$f_n = f_a \cdot 1,0595^n \qquad L_n = \frac{v}{2 \cdot f_n} = \frac{v}{2 \cdot f_a \cdot 1.0595^n}$$

$$\vdash\!\!\!\!\!\longrightarrow\!\!\!\!\!\vdash\!\!\!\!\dashv$$
$$\cdots \; n=2 \; n=1$$

$$f_n = f_a \cdot 1,0595^n \qquad L_n = \frac{v}{2 \cdot f_n} = \frac{v}{2 \cdot f_a \cdot 1.0595^n}$$

$$\vdash\!\!\!\!\!\longrightarrow\!\!\!\!\!\vdash\!\!\!\!\dashv$$
$$\cdots \; n=2 \; n=1$$

$$L_{n-1} - L_n = \frac{v}{2f_g \cdot 1.0595^{n-1}} - \frac{v}{2f_a \cdot 1.0595^n}$$

$$= \frac{v \cdot 1.0595}{2f_a \cdot 1.0595^{n-1} \cdot 1.0595} - \frac{v}{2f_g \cdot 1.0595^n}$$

$$= \frac{v}{2 \cdot f_a \cdot 1.0595^n} \cdot 0.595 = L_n \cdot 0.0595$$

$$\left(\begin{array}{l} L_{n-1} = L_n \cdot 1.0595 \\[2mm] L_n = \dfrac{L_{n-1}}{1.0595} \end{array} \right.$$

$$= L_n \cdot 0.0595 = \frac{L_{n-1}}{1.0595} \cdot 0.0595$$

$$= L_{n-1} \cdot 0.0561$$

3)

$\uparrow$ 60 km/t = 16.67 m/s bruker formel 7.17

$\square$

$$f_o = \frac{V + V_o}{V - V_s} f_s$$

$V = 343$ m/s

$f_s = 600$ Hz

$\uparrow$ 110 km/h = 30.56 m/s

$\square$

før politiet har kjørt forbi   etter

$V_s = 30.56$ m/s $V_s = -30.56$

$V_o = -16.67$ m/s $V_o = 16.67$, $f_o = 577.7$ Hz

$$f_o = \frac{343 - 16.67}{343 - 30.56} \cdot 600 = 626.67 \text{ Hz}$$