

QUESTION: Calculate the change in sound level when the intensity of a sound is doubled

SOLUTION:

As in the task it is not specified whether to calculate the change in sound **intensity** level or sound **pressure** level, let's calculate the change in sound intensity level.

$$L_1 = 10 \lg \frac{I_1}{I_0} \rightarrow \text{IS THE GENERAL FORMULA}$$

$$L_2 = 10 \lg \frac{I_2}{I_0}$$

$$\text{As } I_2 = 2I_1$$

$$L_2 - L_1 = 10 \lg \frac{2I_1}{I_0} - 10 \lg \frac{I_1}{I_0} = 10 \lg \left(\frac{2I_1}{I_0} \cdot \frac{I_0}{I_1} \right) = 10 \lg 2 = 3.03 \text{ dB}$$

ANSWER:

$$L_2 - L_1 = 3.03 \text{ dB}$$