

Problem 15.16

If one guitar string is tuned to a frequency of 440 Hz and a string on another guitar produces 8 beats per second when played together with the first string, what are possible frequencies of the second string?

For beats:

$$f_1 - f_2 = f_{\text{beats}} \quad \text{or} \quad f_2 - f_1 = f_{\text{beats}}$$

so there are two possibilities

$$440\text{Hz} - X = 8\text{Hz} \quad \text{or} \quad X - 440\text{ Hz} = 8\text{ Hz}$$

so $X = 432\text{ Hz}$ or $X = 448\text{ Hz}$