

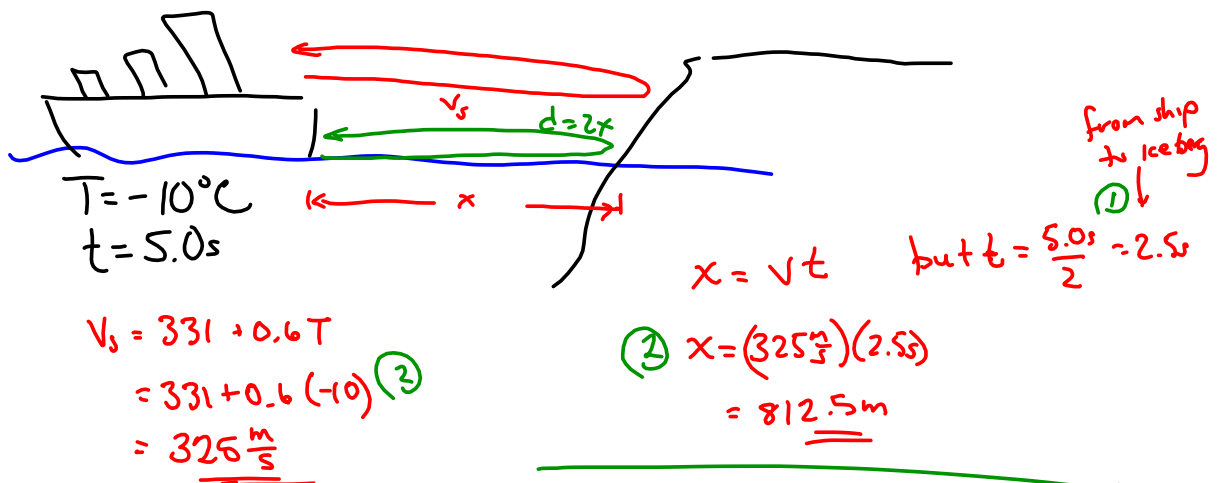
Or.  $T = 15^\circ$

$$v_s = 331 + 0.6T$$
$$= 331 + 0.6(15)$$
$$= 340 \text{ m/s}$$

$$d = vt$$
$$d = (343 \frac{\text{m}}{\text{s}})(10.0s)$$
$$= 3430 \text{ m}$$
$$\approx \underline{\underline{3.4 \text{ km}}}$$

Echoes - the reflection of sound.

A ship sounds a foghorn and hears the echo from a nearby iceberg 5.0s later. If  $T = -10^\circ\text{C}$ , how far away is the iceberg?



$$x = vt \quad \text{but } t = \frac{5.0\text{s}}{2} = 2.5\text{s}$$

$$\textcircled{2} \quad x = (325 \frac{\text{m}}{\text{s}})(2.5\text{s})$$

$$= \underline{\underline{812.5\text{m}}}$$

$$v_s = 331 + 0.6T$$

$$= 331 + 0.6(-10) \textcircled{3}$$

$$= \underline{\underline{325 \frac{\text{m}}{\text{s}}}}$$

$$d = vt$$

$$= (325 \frac{\text{m}}{\text{s}})(5\text{s}) \textcircled{2}$$

$$= 1625 \text{ m}$$

$$\text{But } x = \frac{d}{2} = \underline{\underline{812.5\text{m}}} \textcircled{2}$$

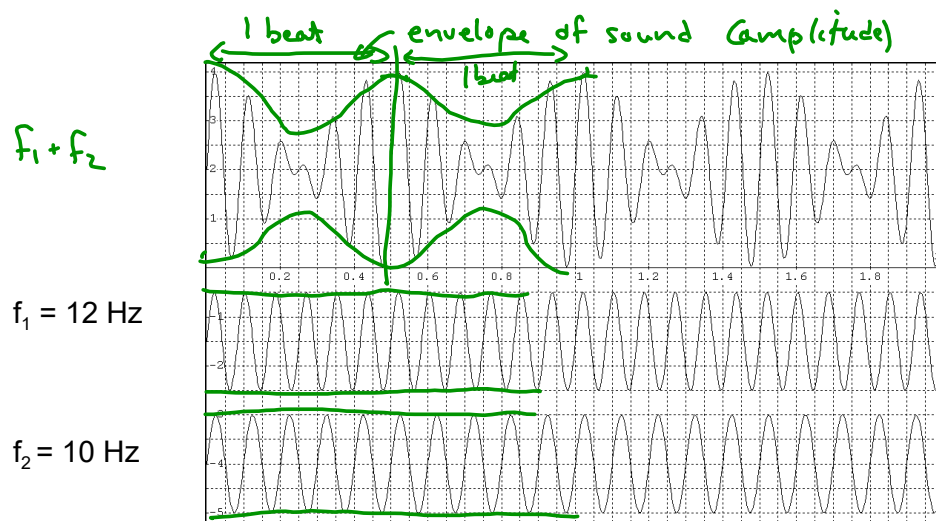
Resonance - Everything has a frequency (multiple actually)  
at which it will vibrate

Resonance is an object vibrating at one  
frequency causing another to vibrate at  
the same frequency.

## Beat Frequency

We know from our experiments on the slinky spring that waves can add constructively and destructively - making bigger waves or smaller waves.

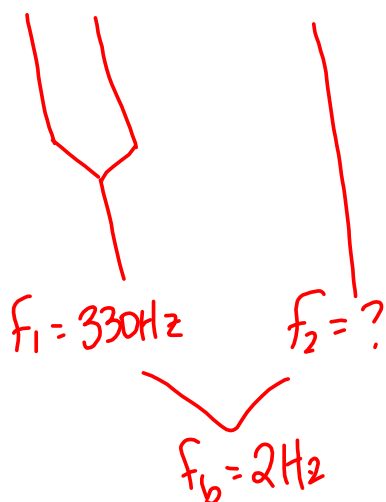
So...what happens when two sounds are played together?



Beat frequency

$$f_b = |f_1 - f_2|$$

The E-string on a guitar is played with a tuning fork of frequency 330 Hz and a beat frequency of 2 Hz is observed. What are the possible frequencies of the string?



$$f_b = |f_1 - f_2|$$

$$2\text{ Hz} = |330 - f_2|$$

$$f_2 = 328\text{ Hz OR } 332\text{ Hz}$$







Homework

Worksheet #7-10