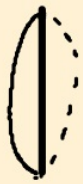
# Waves Activote Review

- **Test is tomorrow.**
- **Unsure about anything? Last chance to ask questions.**

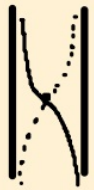
**1. You are stranded on a desert island. To amuse yourself, you blow over the top of a bottle and produce a note. (There isn't much to do on a desert island.) The harmonic that creates the note could be drawn as:**

**A**

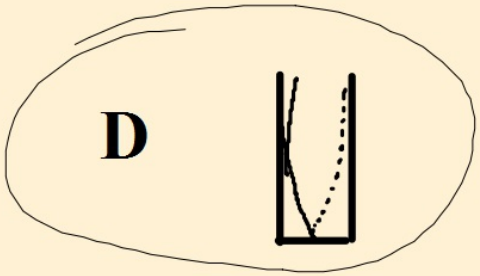
**B**



**C**



**D**



# 2. Which of the following are examples of transverse waves?

A: Light, sound, water ripples

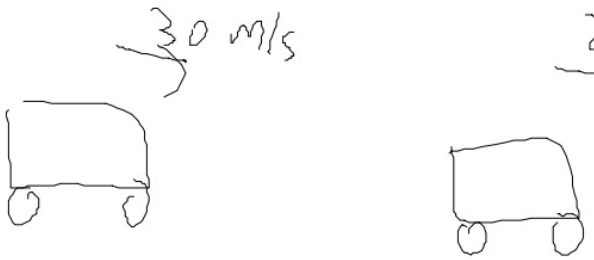
B: Light, radio, ultraviolet

C) Light, sound, earthquakes

D) Light, sound, infrared

**3. In a high speed car chase, the police car is moving at 30 m/s, and the evil genius or dumb criminal (only time will tell) is moving at 25 m/s. If the first note of the police siren has a pitch of 520 Hz, what frequency will the criminal hear? (Use 343 m/s as the speed of sound.)**

**a) 611 Hz b) 513 Hz c) 528 Hz d) 520 Hz**




$$f' = f_0 \left( \frac{V_{sound} + V_{observer}}{V_{sound} - V_{source}} \right)$$

$$f' = 520 \left( \frac{343 + (-25)}{343 - (+30)} \right)$$

$$f' = 520 \left( \frac{343 - 25}{343 - 30} \right)$$

$$f' = 528 \text{ Hz}$$

$f_0 = 520 \text{ Hz}$

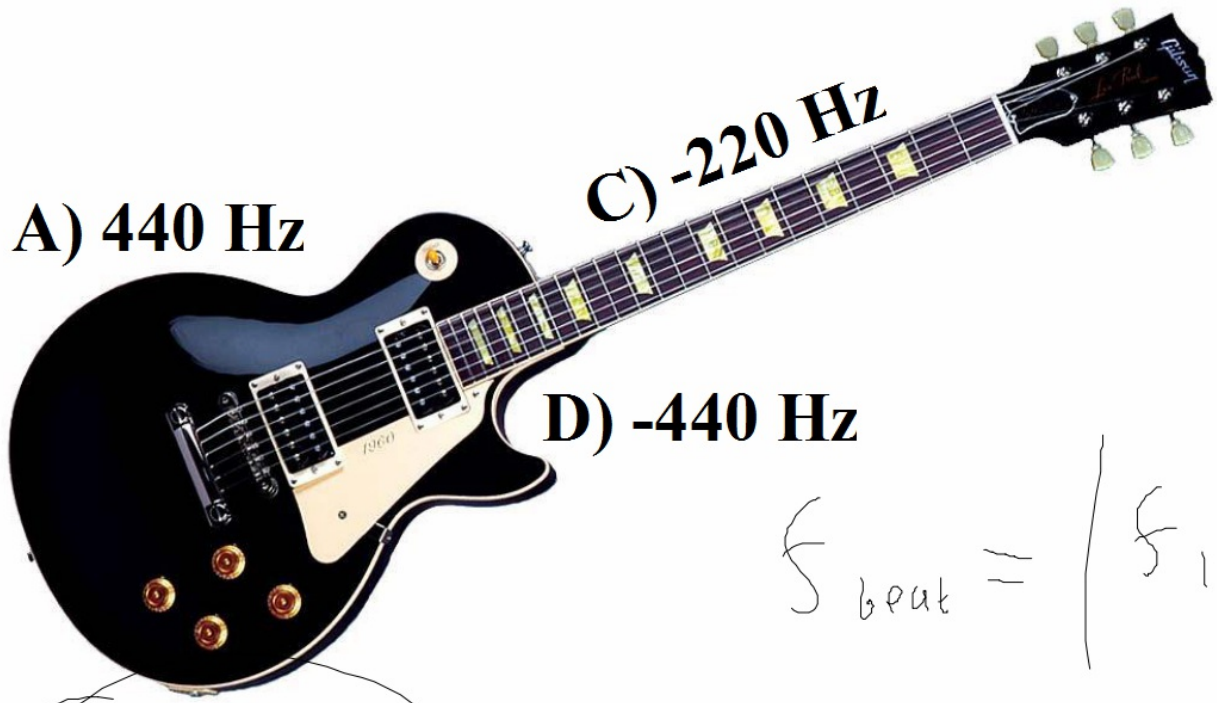
$f' = ?$

$v = 343 \text{ m/s}$

$V_{source} = +30$

$V_{observer} = -25$

**4. Rodolfo plays a high E on his guitar (330 Hz), and at the same time Nate plays an A (110 Hz). The frequency of the beats produced will be:**



A) 440 Hz

C) -220 Hz

D) -440 Hz

B) 220 Hz

$$f_{beat} = |f_1 - f_2|$$

$$= 330 - 110 = 220\ \text{Hz}$$

**5. What is the definition of frequency (or pitch)?**

$T = \frac{1}{F}$ → Time Period

**A: The number of seconds per wave.**

**B: The number of waves per second.**

**C: The time it takes to move through a full wave.** → Time Period.

**D: The distance across a full wave.**

↓ Wavelength.

**A flute has two open ends. Calculate the frequency produced by placing your finger such that the length of the air column is 0.3m. (Use 343 m/s as the speed of sound.)**

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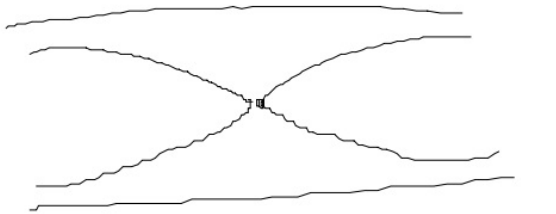

$v = 2Lf$

$L = 0.3\,m$

$v = 343\,m/s$

$f = \frac{v}{2L}$

$f = \frac{343}{2(0.3)}$

$f = 572\ Hz$

$$f = \frac{\text{no. of waves}}{\text{time taken}}$$

$$v = f\lambda$$

$$v = \frac{d}{t}$$

**You're sat in a boat, when a ripple passes you. You count 8 crests in 4 seconds. You also notice that the wave takes 6 seconds to travel down the 3 meter length of the boat. What is the wavelength of the wave?**

8 crests

$= 7$ complete waves

$$f = \frac{\text{waves}}{\text{time}} = \frac{7}{4}$$

$$f = 1.75 \text{ Hz}$$

$$v = \frac{3}{6} = 0.5 \text{ m/s}$$

$$\lambda = \frac{v}{f} = \frac{0.5}{1.75} = 0.29 \text{ m}$$