Physics 231 -   6-Dec-99

- Announcements
- Sound
  - Interference and Beats
  - Doppler Effect
  - Sound in pipes
- Quiz

Interference and Beats

- $\sin(\omega_1 t) + \sin(\omega_2 t) = 1/2 \sin((\omega_1 t + \omega_2 t)/2)$
- $\times \cos((\omega_1 - \omega_2)t/2)$

- Beat Frequency: $f_1 - f_2 = 1/(2\pi)(\omega_1 - \omega_2)$

Doppler Shift

- Moving Source - Stationary Observer

Doppler Shift

- Moving Observer - Stationary Source

- Both Source and Observer Moving

Q1 - Answer = c
Q2 - Problem A - Last name A-K

A piano key produces 3 beats/second when it is played along with a tuning fork of frequency 256 Hz. It is noted that the beat frequency increases when the string is tightened. What is the frequency of the string?

A. 250 Hz

B. 253 Hz

C. 259 Hz

D. 262 Hz

E. 254.5 Hz

Q1 - Answer = c
Q2 - Problem B - Last Name L-Z

- A tuning fork with frequency 400 Hz produces 2 beats/second when struck along a guitar string. When the string is tightened, it is noted that the beat frequency decreases. What is the frequency of vibration of the guitar string?

A. 396 Hz

B. 398 Hz

C. 399 Hz

D. 402 Hz

E. 404 Hz