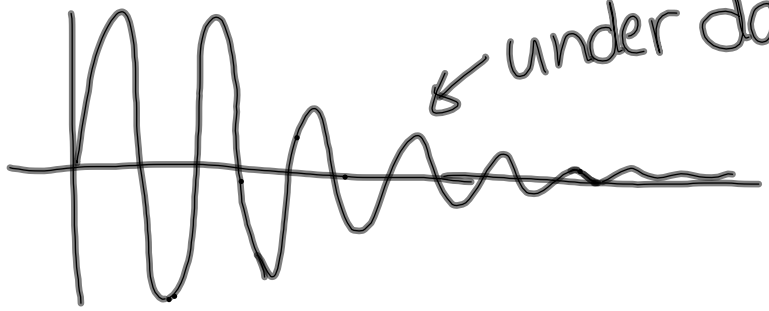
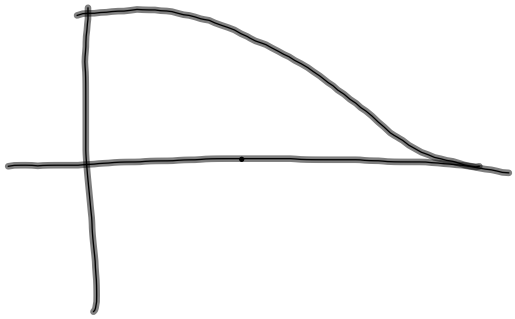
Damped Oscillation

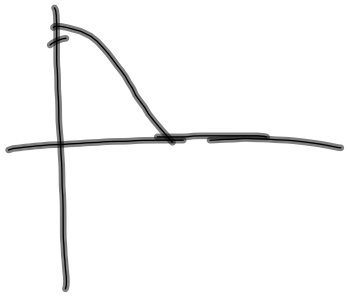


3 types
critically, over, under

over damped: LOTS of friction



Critically damped



transverse wave

particles move perpendicular to the direction of the wave

Longitudinal wave

particles move in the same direction as the wave.

→ SOUND!

Frequency: how often it does one cycle

cycles/sec

units: Hz

symbol: f

Period: time of 1 cycle

units: s

symbol: T

$f = \frac{1}{T}$ $T = \frac{1}{f}$

Amplitude: maximum distance from equilibrium

symbol: A

units: m

Wavelength: the distance from one peak to another peak.

symbol: λ

units: m

wave speed/velocity:

how fast the wave moves through the medium

symbol: v

units: m/s

$v = \lambda f$ $v = \frac{\lambda}{T}$

What is the period of this wave?

$V = 343\ m/s \quad \lambda = 5\ cm$

$T = ?$ $\qquad V = \frac{\lambda}{T}$

$\left(343 = \frac{.05}{T}\right)T$

$\frac{343T = 0.05}{343}$

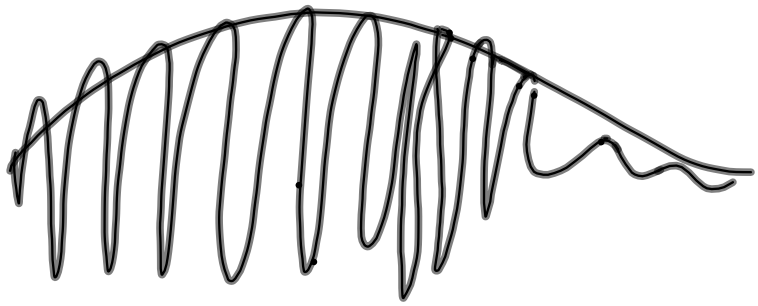
$T_1 = 1.45 \times 10^{-4}\ s$

We hear 5 beats/sec
what is the frequency of the second tone?

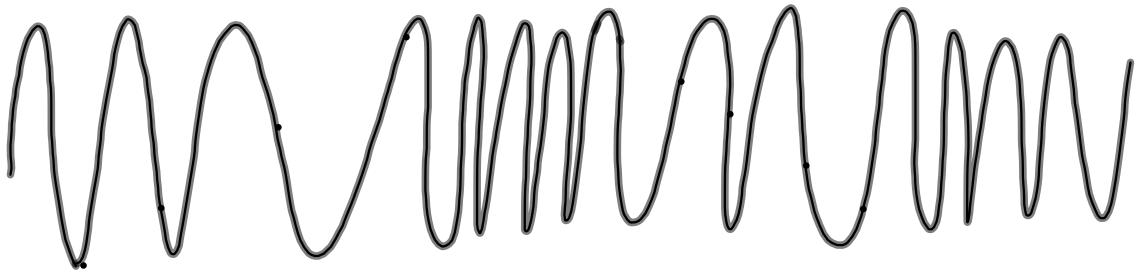
$f_1 = \frac{1}{1.45 \times 10^{-4}} = 6896\ Hz$

$f_2 = 6891\ Hz$ or $6901\ Hz$

AM : Amplitude modulation



FM : Frequency modulation



comes back inverted