p 234 q13

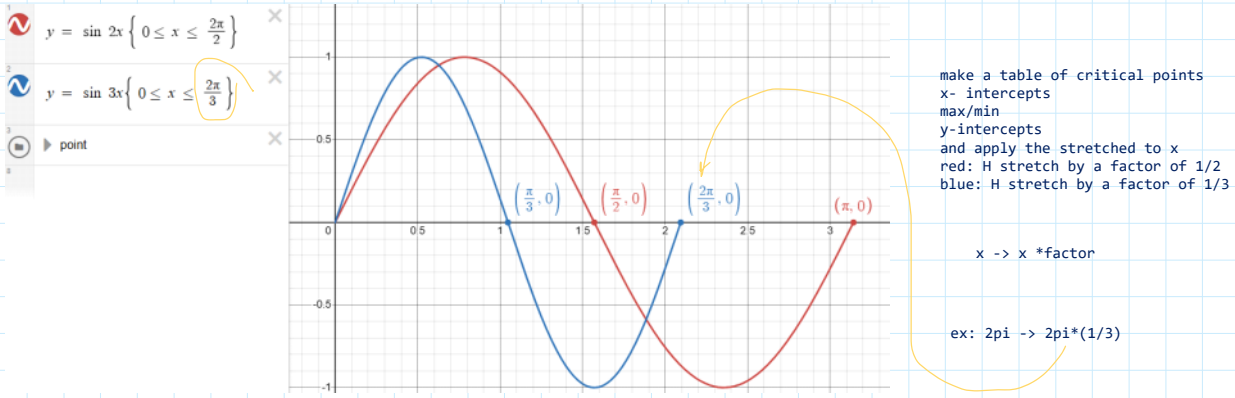
13. The second harmonic in sound is given by $f(x) = \sin 2x$, while the third harmonic is given by $f(x) = \sin 3x$. Sketch the curves and compare the graphs of the second and third harmonics for $-2\pi \le x \le 2\pi$.

Did You Know?

A harmonic is a wave whose frequency is an integral multiple of the fundamental frequency. The fundamental frequency of a periodic wave is the inverse of the period length.

sketch = always by hand

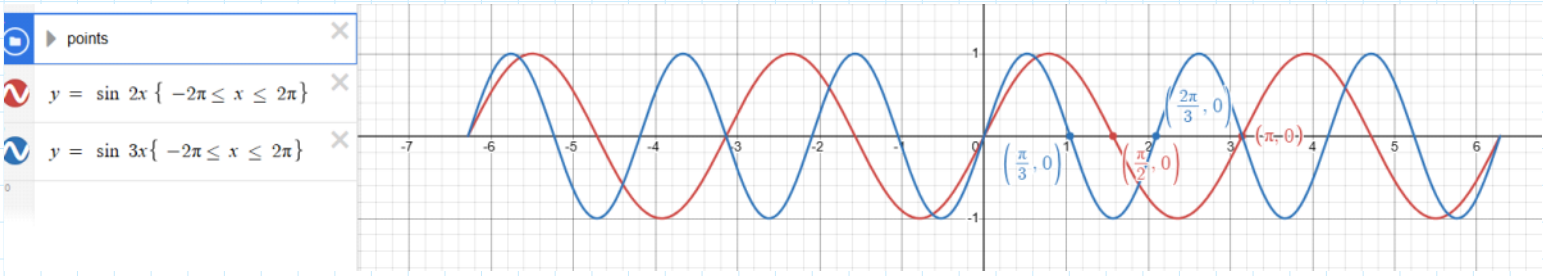
https://www.desmos.com/calculator/zt4npfnqkh



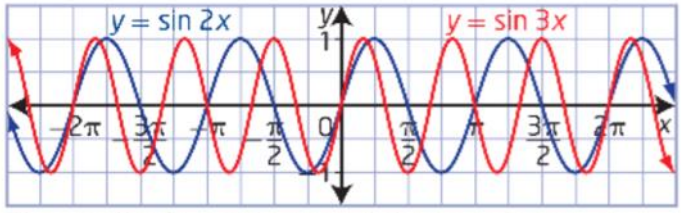
make a table of critical points
x- intercepts
max/min
y-intercepts
and apply the stretched to x
red: H stretch by a factor of 1/2
blue: H stretch by a factor of 1/3

x -> x *factor

ex: 2pi -> 2pi*(1/3)



13.



The amplitude, maximum, minimum, y-intercepts, domain, and range are the same for both graphs. The period and x-intercepts are different.