PHYS2063 Wave Physics Homework #7 Due Thursday 15 Sep 2022

This homework assignment is due at the start of class on the date shown. You may submit a PDF of your solutions to the Canvas page for the course, or bring a paper copy to class.

In class we derived the following formula for the fundamental frequencies for transverse planar vibrations of the loaded string with n degrees of freedom:

$$\omega_j^2 = 2\omega_0^2 \left[1 - \cos\left(\frac{j\pi}{n+1}\right)\right] \qquad j = 1, 2, 3, \ldots, n$$

Show that this formula reduces to the results we derived in class last week for $n = 2$ and $n = 3$, when we analyzed a system of n masses connected by $n+1$ springs, oscillating in one dimension.