1.13 Playing the Cello (in equal temperament)

$$N = \left\lfloor \frac{8x}{a} + \frac{1}{2} \right\rfloor - 3 \qquad \text{(3 for the key of C major)}$$

$$n = N \bmod 7 \qquad \text{(0=tonic, 6=sub-tonic)}$$

$$\sigma = \lfloor N/7 \rfloor \qquad \text{(which octave we are in)}$$

$$f = (130.8 \text{ Hz} \times 2^{\sigma}) \left\{ 1, 2^{\frac{2}{12}}, 2^{\frac{4}{12}}, 2^{\frac{5}{12}}, 2^{\frac{7}{12}}, 2^{\frac{9}{12}}, 2^{\frac{11}{12}} \right\}[n] \qquad \text{(note frequency)}$$

$$L = \frac{1}{2f} \sqrt{\frac{T}{\rho}} \qquad (T\text{=tension, } \rho\text{=mass per unit length})$$