Calculations

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>>> from math import pi, sqrt
>>> M = lambda m_w: m_w + 25 + 5/3
>>> T_p = lambda M: 2 * pi * sqrt(M / 19600)
>>> m_ws = [100, 150, 200, 250]
>>> n = 50
>>> [M(m_w) for m_w in m_ws]
[126.66666666666667, 176.66666666666666, 226.66666666666666,
276.6666666666667]
>>> [T_p(M) for M in [M(m_w) for m_w in m_ws]]
[0.5051065538838905, 0.5965256740218038, 0.6756871530211855,
0.7465007553570076]
>>> T_ps = [T_p(M) for M in [M(m_w) for m_w in m_ws]]
>>> T_ms = [T_n / n for T_n in [25, 29, 32, 28]]
>>> T_ms
[0.5, 0.58, 0.64, 0.56]
>>> [100 * abs((T_p - T_m) / T_p) for T_p, T_m in zip(T_ps, T_ms)]
[1.010985473188757, 2.7703206653934886, 5.281608931236641,
24.983331097610893]
```

1 - How do you calculate the spring constant of a spring?

The spring force constant *k* is the change in force divided by the change in position of a spring, the change in position can be thought of as the elongation that occurs when the spring is stretched across the given change in force.

2 - If the period of oscillation of a spring is 0.5 s, what is its frequency?

The formula for the frequency of an oscillation with period *p* is *1/p*. So The frequency of an oscillation who's period is 0.5 is 1/.5 = 2.