Erik Rodriguez

1. T = $2\pi\sqrt{\frac{L}{9.8}}$

   T = $\frac{2\pi}{\sqrt{9.8}}\sqrt{L}$

   ln(T) = $ln(\frac{2\pi}{\sqrt{9.8}}) \times ln(L)$

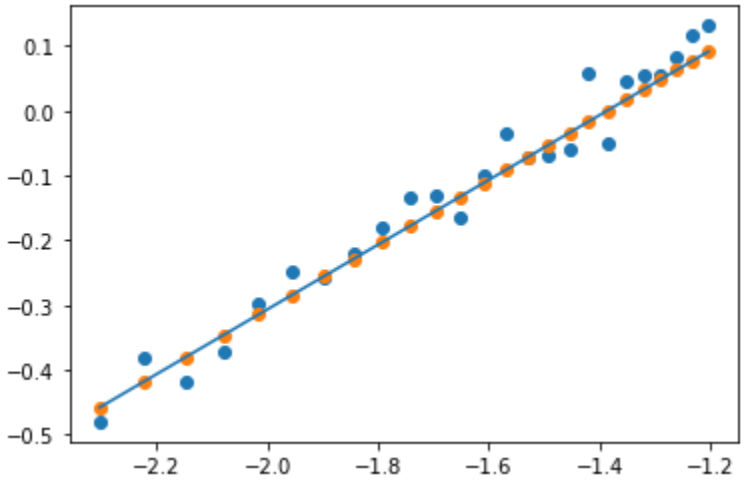
   $\frac{2\pi}{\sqrt{9.8}}$ is our constant k

2. Computed averages of Length data = [0.1, 0.10833299999999998, 0.11666699999999999, 0.125, 0.133333, 0.141667, 0.15, 0.158333, 0.166667, 0.175, 0.183333, 0.191667, 0.2, 0.208333, 0.216667, 0.22499999999999998, 0.233333, 0.241667, 0.25, 0.258333, 0.266667, 0.275, 0.283333, 0.291667, 0.3]

   Computed averages of Period data = [-0.480073, -0.38263733333333333, -0.417417, -0.37325733333333333, -0.2972096666666667, -0.24851933333333331, -0.258357, -0.22191833333333333, -0.180253, -0.135506, -0.12937966666666667, -0.16606733333333334, -0.09964066666666667, -0.034104666666666665, -0.07277466666666665, -0.06938166666666667, -0.060319666666666674, 0.059123999999999996, -0.05024933333333334, 0.046463, 0.05616866666666667, 0.056083999999999995, 0.08332266666666666, 0.11686866666666668, 0.13124866666666668]

3. We have 25 trials for our data.

4. Blue = Average of Our data, Orange = Calculated using T(L), Line f(L) = Predicted using own equation



Linear Graph

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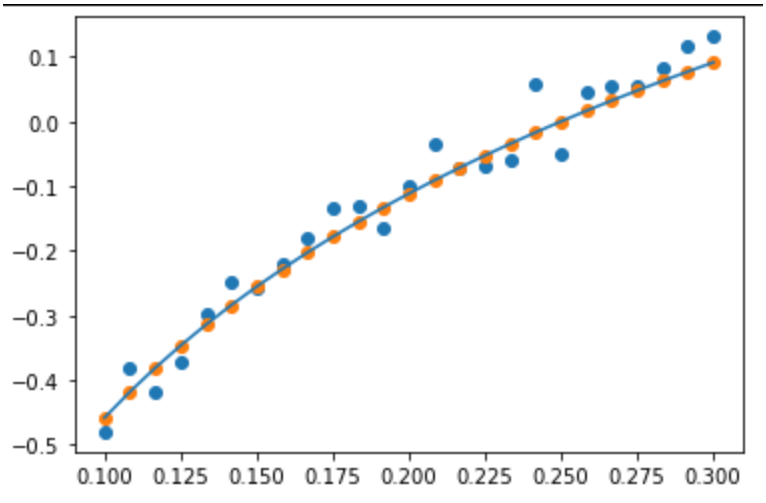

Logarithmic graph

5. f(L) = $\frac{1}{2}ln(L) + ln(2)$

   T(L) = $2 \times \sqrt{L}$

Conclusion

a. The period of a pendulum does not depend on the starting angle. The equation doesn't use a starting angle to produce an accurate period.
b. The period of a pendulum does not depend on the mass. The equation doesn't use mass to produce an accurate period.
c. The ratio of length to period is always a guarantee for a value of g as long as we perform the experiment correctly.
d. Period of 35cm is 11.83, Period of 40cm is 12.65, Period of 45cm is 13.42
e. The general conclusion is that the period is proportional to the varying lengths and so that if the length changes so does the period.