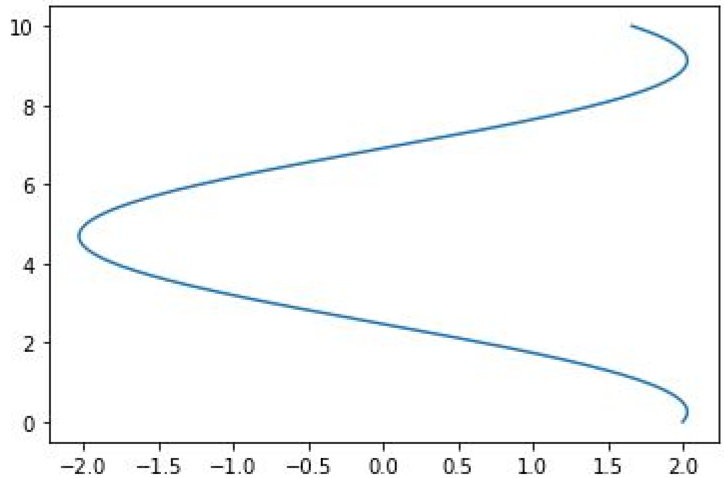
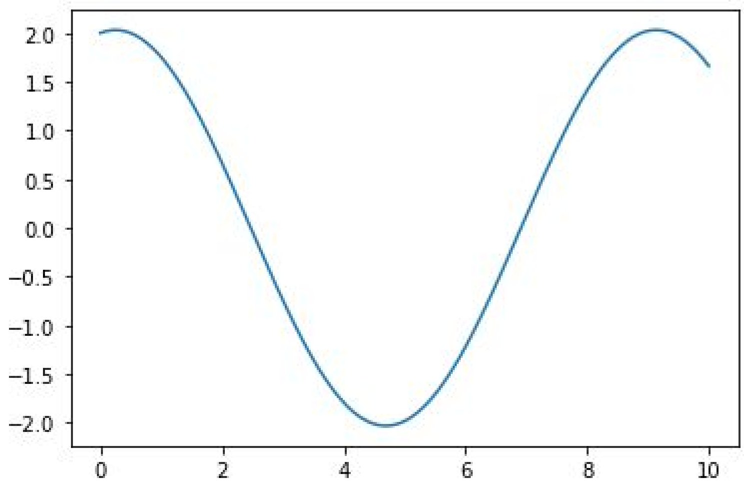
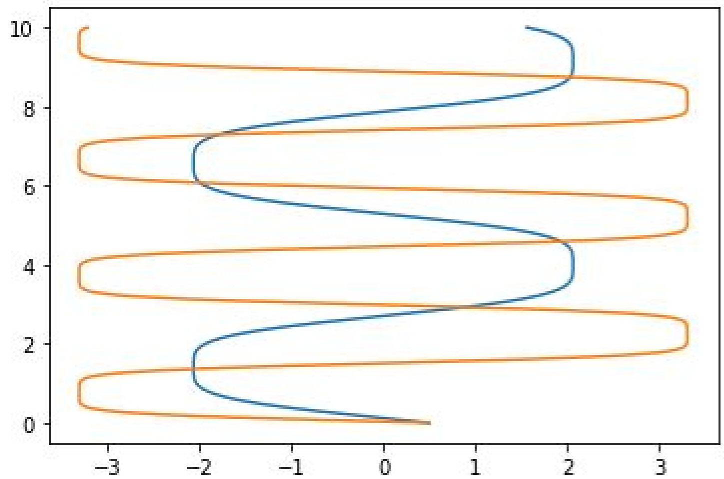
Jessica Hamilton
Computational
Exercise 19
Anharmonic Oscillator with Euler's Method

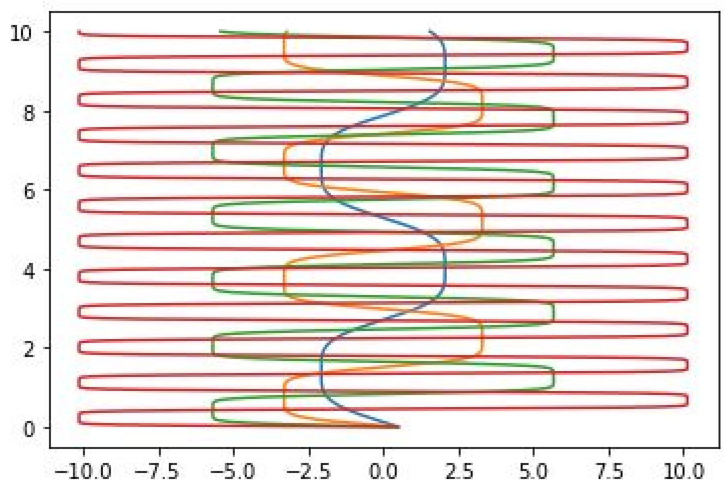


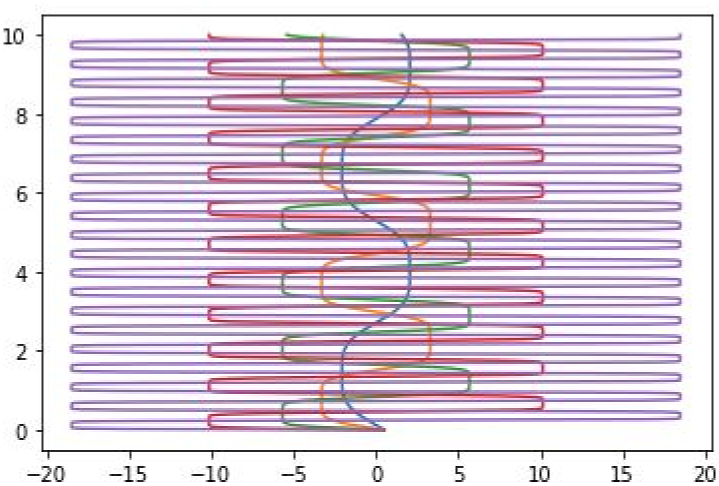


Above are the graphs produced using the Euler's method to determine the motion of a particle subject to the spring potential, when you use p =2 for $f(x) = -kx^{p-1}$

WHen we vary the P from 2 to 12 in even increments we get the following plots:







For the motion of the particle, it will reach max velocity when it passes through the equilibrium position (x=0). This is what I would expect when looking at the slope of the position function. The greatest slope is at that point. When you view the change in power graph, this shows a change in amplitude in correlation with the change in period. If you increase the period, the amplitude will decrease. The two are inversely proportional, which makes sense. When varying the power, the functions still oscillate. The shape of the functions change as you change the constants, specifically the initial position and the velocity.

For an interesting tidbit, the graphs below show the change in P at initial position =0 and change in velocity