Chapter 7: Nonlinear Pendulum Problems

1. Lengthening the pendulum (g/l less than 2) causes the period of the solution to be longer, while shortening the pendulum causes the period to be shorter.

2. Solutions with initial conditions $0.7 < QI1 < 1.1$, $QI2 = 0$ look like ovals centered at the origin in Figure 7.18 where $x = Q1$ and $y = Q2$.

3. The solution with

    $$\theta_0 = 2.8289$$

    does not "flip over" while

    $$\theta_0 = 2.8290$$

    does. Both have a very long section where the solution is nearly flat.

4. The linear damping causes the amplitude of the oscillations to gradually get smaller but the period remains roughly the same (which is nice for grandfather clocks). Increasing the coefficient of friction causes a much more rapid decline in amplitude.