PHY 480/905

Session 8

Stings and Things:

2. It worked! (see file0.out, file1.out, file2.out, and file3.out)

3. It worked! (see test_stream_x2.7.out)

Damped (Un-driven) Pendulum:

2. Yes! See diffeq_pendulum0.2.dat

3. Comparing, we have that alpha = b/M and therefore b/2M = alpha/2

See the folder entitled “Damped (Undriven) Pendulum Plots” for plots

I used 2*omega_0 = 1 and

Undamped: alpha = 0

Underdamped: alpha = 0.1 < 2*omega_0

Critically damped: alpha = 2 = 2*omega_0

Over damped: alpha = 3 > 2*omega_0

Damped (Driven) Pendulum:

1. The green points plotted once a period show the envelope of the wave.

2. I becomes periodic at about t = 25

3. Yes, see Damped Driven Pendulum Periodic Plot. The frequency is about 0.1 Hz.

Looking for Chaos:

2. See the folder entitled “Looking for Chaos Plots”

Combination 3 seems to wrap around each cycle 3 times

The number of frequencies that f(t) is built out of can be determined by the number of peaks in each repeating section of the wave. The second and third combinations seem to be made out of 3 frequencies.

3. Chaotic Pendulum Shifted shifts theta0 by -0.01 (so theta0 = -0.81). See the folder entitled Chaotic Pendulum Plots. Both plots start off the same and then deviate from one another wildly!