Ay190 – Worksheet 14
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Bruce Willis' Stunt Double: Matthias Raives

Advection and Shocks

Below are plots of the function

$$\Psi = \frac{1}{8} \sin\left(\frac{2\pi x}{L}\right)$$

evolved through time. $L = 100$, and $x \in [0, 100]$. Below the plots of the functions are plots of the size of the time step as a function of time. I also plotted the analytical solution in red, just because it was already in the code, though it doesn't seem especially useful here.
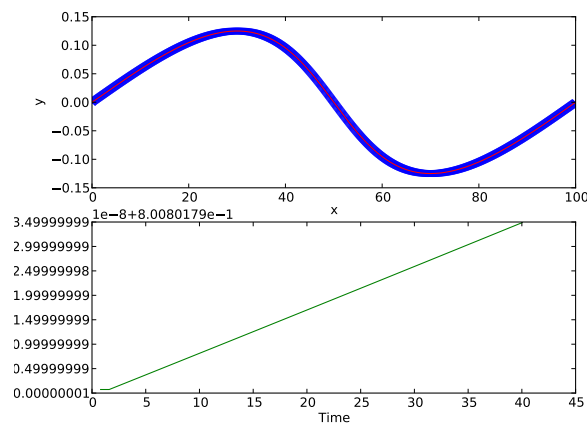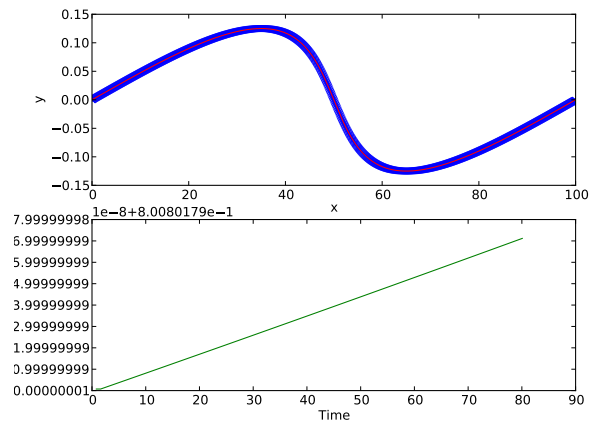

Figure 1: This is a plot of the function at t=50.
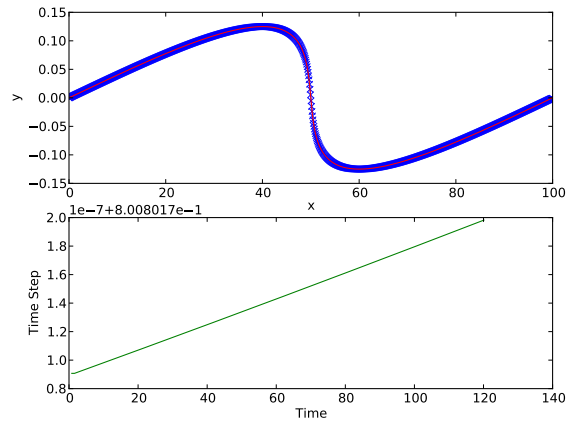
Figure 2: This is a plot of the function at t=100.

Figure 3: This is a plot of the function at t=150. You can begin to see the formation of the shock as the peaks get closer.
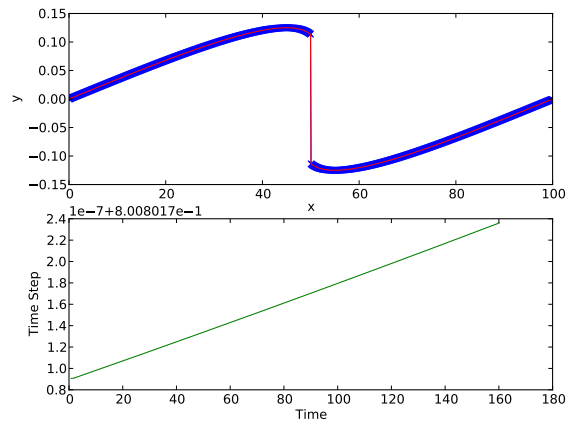

Figure 4: This is a plot of the function at t=200. By now the shock has fully formed.

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