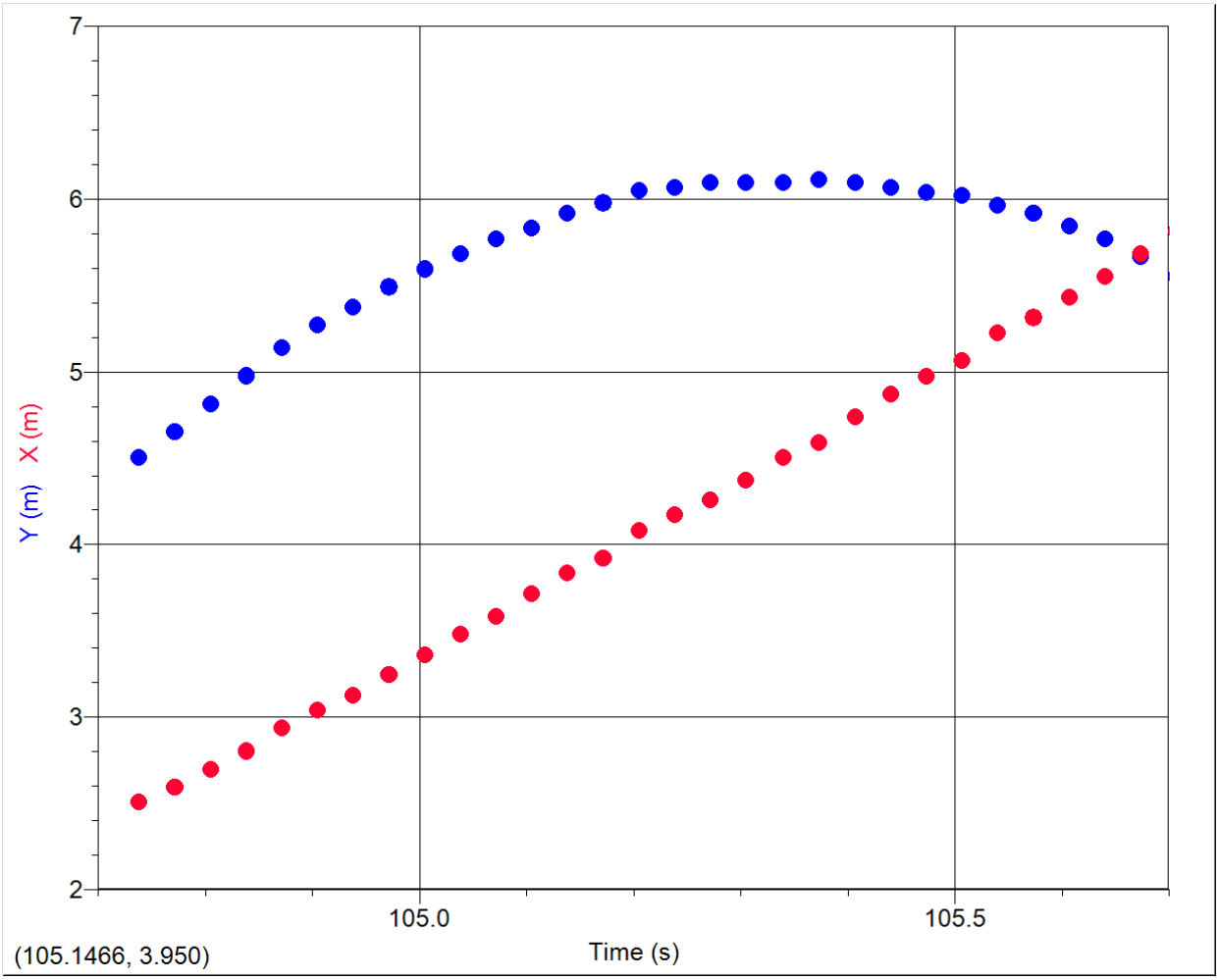
This family lost their collection of home movies in a disaster, so they decided to recreate the movies with their older teenage sons. The resulting film is a comedy of errors as the sons attempt to learn things as if they were grade school age. The first part of the clip is just to introduce the context; a teenager is off to his first day of first grade. In the second part of the clip, the father is trying to teach his son how to play basketball. This clip is great for video analysis because of the perspective of the cameraman.

Following are plots from LoggerPro (http://www.vernier.com/soft/lp.html), though similar plots can be constructed with the free software Tracker (http://www.cabrillo.edu/~dbrown/tracker/). These plots show how displacement and velocity change with time.

Displacement:

The blue in this plot represents the y-displacement; notice the plot is parabolic in the first ~2 seconds, before the basketball hits the rim. The x-displacement is linear with respect to time because there is no acceleration in the x-direction.


7
6
5
4
3
2
Y (m) X (m)
105.0
105.5
Time (s)
(105.1466, 3.950)

Velocity:

This plot shows velocity as the time progresses. The red triangles represent the x-component of the velocity, and, before the ball strikes the rim, this component of the velocity is about 2.5 m/s. The y-component of the velocity first decreases, goes to zero at the top of the trajectory, and then begins increasing in the negative direction.